Old Series, Vol. LVI

CONTINUATION OF THE BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

New Series, Vol. XLVIII

The Auk

A Quarterly Journal of Ornithology

Vol. XLVIII OCTOBER, 1931 No. 4

PUBLISHED BY

The American Ornithologists' Union

LANCASTER, PA.

Entered as second-class mail matter in the Post Office at Lancaster, Pa.

CONTENTS.

THE LIFE HISTORY OF RIEFFER'S HUMMINGBIRD (AMAZILIA TZACATL TZACATL) IN PANAMA AND HONDURAS. By *Alexander F. Skutch.* (Plates VIII–X) 481

SNOWY OWL MIGRATION—1930–1931. By *Alfred O. Gross.* (Plate XI) . . 501

NESTING HABITS OF THE BLACK-THROATED BLUE WARBLER. By *Katharine C. Harding.* (Plates XII–XIII) 512

THE NEW A. O. U. CHECK-LIST. By *Witmer Stone* 523

TWO-YEAR RECORD OF THE RUBY-THROAT'S VISITS TO A GARDEN. By *A. L. Pickens* and *Lura P. Garrison* 532

SOME CAUSES OF MORTALITY AMONG BIRDS. By *Frederick C. Lincoln* . . . 538

A STUDY OF THE HOME LIFE OF THE ALDER FLYCATCHER (EMPIDONAX TRAILLI TRAILLI). By *Henry Mousley.* (Plates XIV–XV) 547

QUANTATIVE METHODS IN UPLAND GAME BIRD INVESTIGATION. By *H. M. Wight* 553

MANNERS OF HOLBOELL'S GREBE IN CAPTIVITY. By *F. B. White* 559

ADDITIONAL DATA ON THE BIRDS OF THE BOSTON PUBLIC GARDEN. By *John H. Conkey* 564

A GRAND ISLAND, NEW YORK, HERONRY. By *Albert R. Shadle.* (Plate XVI) 567

A NEW HONEY CREEPER FROM THE AMAZON. By *Ernest G. Holt* 570

BIRD WEIGHTS OF 52 SPECIES OF BIRDS. (TAKEN FROM NOTES OF WM. VAN GORDER). By *Sidney R. Esten* 572

AN ACCOUNT OF THE YELLOW-GREEN VIREO (VIREOSYLVA FLAVOVIRIDIS CASSIN). By *James L. Peters* 575

GENERAL NOTES.—Great Black-backed Gull Breeding in Essex County, Mass., 588; Breeding of the Great Black-backed Gull and Double-crested Cormorant in Maine, 589; Bird Predators of Common Tern, 592; Double-crested Cormorant in the Chicago Area, 593; Rare Birds in Lancaster Co., Pa., 593; American Egret in Connecticut, 593; Yellow-crowned Night Heron in Ohio, 593; Abnormal Sets of Heron Eggs in Coastal South Carolina, 594; Nesting of the Sandhill Crane in Calhoun County, Michigan, 594; Notes from Southern Alabama, 595; Notes on Bird Life in Southern Florida, 595; A Knot in Montgomery County, Ohio, 596; The Hudsonian Godwit in the Dominican Republic, 596; Wilson's Phalarope in South Carolina, 597; Red Phalarope in Ocean County, N. J., 597; Black Vulture Nesting in Washington County, Tenn., 598; The Black Vulture in Greenbrier County, West Virginia, 598; The Black Vulture at Harper's Ferry, West Virginia, 599; Marsh Hawk vs. Coyotes, 599; Barn Owl Nesting in Springfield, Mass., 599; The Generic Name Calao, 600; Belted Kingfishers Wintering in the Yellowstone National Park, 601; Tragedies among Yellow-billed Cuckoos, 602; How the Night Hawk Moves Its Eggs, 602; Arkansas Kingbird at Roxbury, Wisconsin, 603; Northern Crested Flycatcher in Western Panama, 603; An Albino Empidonax, 603; Magpie Breeding in Captivity, 604; The American Magpie at Point Lookout, Maryland, 604; Notes on the Starling in the Northern Parts of its North American Range, 605; Western Meadowlark at Battle Creek, Mich., 606; Orchard Oriole in the Adirondacks, 606; Icterus pustulatus a new Bird to the A. O. U. Check-List, 606; Nesting of a Pair of Red-winged Blackbirds on a Hilltop, 607; On the Color of the Iris and Other Characteristics of the Boat-tailed Grackle, 607; On the Color of the Iris in the Boat-tailed Grackle, 609; Lapland Longspurs at Brigantine, N. J., 610; Some Nesting Records from the Vicinity of Washington, D. C., 610; Ammospiza caudacuta diversa (Bishop) a Valid Race, 610; Junco annectens Baird in Utah, 611; A Seventeenth Century Representation of the Cardinal, 611; On the Status of Chlorospingus olivaceus, 612; Prothonotary Warbler Breeding in West-central Michigan, 612; Brewster's Warbler in Calhoun County, Michigan, 613; Chestnut-sided Warbler Breeding in Montgomery County, Pa., 613; Pine Warbler Breeding in Michigan, 614; Prairie Marsh Wren Wintering near Madison, Wisconsin, 614; Some Unusual Bird Notes from Cheshire County, New Hampshire, 615; Bird Life on Brasstown Bald, Georgia, 616; Rare Birds from Keweenaw County, Michigan, 616; Some Additional Notes from Michigan, 618; Notes on Hawks and Owls in Sevier Co., Utah, 618; Notes on Two Birds from San Diego County, California, 620; Unusual Nesting Concentration in a Single Tree, 621; Use of Former Nest Sites, 622; Protective Calls of Two Species of Birds, 622.

RECENT LITERATURE.—Swarth's 'Avifauna of the Galapagos Islands,' 624; Slevin's 'Log of the Schooner "Academy",' 625; Uchida's 'Birds of Mt. Fuji,' 626; Low's 'Literature of the Charadriiformes,' 627; Mills' 'Bird Memories of the Rockies,' 627; Schorger's 'Birds of Dane Co., Wisconsin,' 627; The Indiana Audubon Year Book, 628; Supplement to Wayne's 'Birds of South Carolina,' 628; La Touche's 'Birds of Eastern China,' 628; Berlioz's, 'La Vie des Oiseaux,' 628; Delacour and Joubille on Birds of the Peracel Islands, 629; Bangs and Van Tyne on Birds of Laos and Tonkin, 629; Lönnberg on Birds from South Gobi, 630; Taverner on Canada Geese, 630; Lowe on the Occurrence of Broadbills in Africa, 631; The Ornithological Journals, 632; Ornithological Articles in Other Journals, 644.

OBITUARIES.—George Lincoln Fordyce, 647; Daniel William Shea, 648; Henry Lane Eno, 648.

NOTES AND NEWS.—Dr. A. K. Fisher's Retirement, 649; Ninetieth Birthday of Otto Widmann, 649; Expeditions of the Philadelphia Academy, 649; Annual Meeting of the St. Louis Bird Club, 649; Dr. C. Hart Merriam receives a Roosevelt Medal, 650; Shortened Season for Ducks, 650; The National Association of Audubon Societies, 650; Annual Meeting of the A. O. U., 651; Twenty Years of 'The Auk,' 651; Date of Publication of the A. O. U. Check-List, 651.

RIEFFER'S HUMMINGBIRD (*Amazilia tzacatl tzacatl*) INCUBATING IN A BOUGAINVILLEA BUSH. ALMIRANTE, PANAMA, MARCH 6, 1929.

THE AUK:

A QUARTERLY JOURNAL OF ORNITHOLOGY.

VOL. XLVIII. OCTOBER, 1931. No. 4.

THE LIFE HISTORY OF RIEFFER'S HUMMINGBIRD (*AMAZILIA TZACATL TZACATL*) IN PANAMA AND HONDURAS.[1]

BY ALEXANDER F. SKUTCH.

(*Plates VIII–X.*)

UPON his arrival almost anywhere in the lowlands of Central America, the first Hummingbird which the traveller with an interest in ornithology is likely to encounter is a medium-sized species with brilliant, metallic green body and head, a bright chestnut-brown tail and a long, slender, slightly curved, black bill, known to the scientific world as *Amazilia tzacatl tzacatl* (De la Llave), to Americans by the book name Rieffer's Hummingbird, and to the natives by no name of specific distinction at all. It is a bird of wide distribution, and from below the equator in Ecuador it ranges northward through twenty-eight degrees of latitude and, crossing the Tropic of Cancer, is found in the lower Rio Grande Valley in Mexico.[2] A single individual was once captured alive on the northern side of the river near Brownsville, Texas, but apparently its presence in United States territory is rare or accidental.[3] From the hot, humid lowlands of the Caribbean coast of Central America and Colombia to the cool plateaus of Bogotá and Guatemala City, this adaptable creature finds itself at home. It seems everywhere to prefer open country to the dark, sunless lowland forests. At every point I have visited in the humid Caribbean lowlands of Central America, in Panama, Honduras and Guate-

[1] Studies of the life histories of tropical American birds, No. 2.
[2] Ridgway, Birds of North and Middle America, V. p. 408, 1911.
[3] Bendire, Life Histories of North American Birds, p. 223. 1895.

mala, I have found it the chief and most abundant Hummingbird in the clearings about the habitations of men, and in the banana plantations. In fact, it is the only species of Hummingbird which in these regions seems really a characteristic inhabitant of the lawns, gardens, orchards and ornamental plantings about the settlements. Other kinds, which dwell in the forests or the scrubby second growth, may frequently venture into such clearings, at times in large numbers, as when some favorite tree happens to be in blossom, but their visits are usually transitory, and I have not yet found one nesting there. On the other hand, I have never encountered *Amazilia* within the confines of the heavy lowland forests. Accustomed as we are to birds which frequent indifferently the orchards and gardens, as well as our lighter and more restricted woodlands, it is difficult for one who has not visited the tropics to conceive how strong a barrier to the wanderings of resident birds is formed by the edge of the forest. There are dozens of forest dwelling species, especially among the smaller birds, which one may never see a hundred feet inside the clearings, while the majority of those which prefer the latter habitat, and among them *Amazilia*, show an equal aversion to the depths of the forest. On Barro Colorado Island in Gatun Lake, Rieffer's Hummingbird has made itself at home in the narrow clearing which surrounds the laboratory buildings, separated by a broad expanse of open water from the clearings on the opposite mainland, but apparently rarely penetrates the forest which presses in closely on all hands.

About the habitations of men, where these Hummingbirds seem most at home, they spend their time probing for insects or nectar in the great red blossoms of *Hibiscus sinensis*, which is everywhere a favorite shrub for hedges, dooryards and the town plaza, or else in the blue trumpets of the *Thunbergia* which scrambles over fences and up the sides of houses; or they hover before the coral vine, the blue flowers of *Clitoria*, or the blossoms of some fruit tree. At other times they enter the banana groves and poise beside the long, pendent inflorescences, where they probe the white blossoms clustered beneath their heavy red bracts, swarming with the little, black, stingless bees which gather their pollen and rich nectar. In the early morning one may see them bathing on the dewy surface of the broad banana leaves, over which they glide with vibrant wings,

gathering up the heavy dew drops in their plumage. They are no more sociable than other kinds of Hummingbirds, and dart fiercely at another of the same or a different species if he ventures too near, but the bird attacked almost invariably retreats at the first dashing onslaught, closely followed by the pursuer, and I have never witnessed two birds engaged in an encounter face to face.

Their nesting period, as Mr. Cherrie[1] remarks, probably covers every month of the year. In one part or another of the Caribbean lowlands I have found nests with eggs in every month except July, October and November, and my records include nestings in both the wet and dry seasons. Near Almirante, in western Panama, I encountered my first nest of this species just as the bird was beginning to construct it on December 19, 1928, the height of the rainy season in Bocas del Toro province. Thence, until my departure in early June of the following year, I found 17 nests, all but one in the immediate vicinity of the house I at that time occupied. The majority of these were encountered during the drier weather, which began in January and continued until May. My friend Mr. J. H. Perman reports finding a nest here in July, 1930. On the grounds of the Lancetilla Experiment Station near Tela, Honduras, although the species was quite abundant, I did not discover so many nests as at Almirante. During a seven months' residence here, I found or was shown six nests, one (which was never completed) in April, one each in May and June, two in August and one in September. On Barro Colorado Island in the Canal Zone I found a nest in which the first egg was laid January 11, 1931. Although the nesting period, for the species as a whole, is unusually long, even for tropical birds, and is peculiar in including both the dry and rainy seasons, I do not know how many broods each female may raise, or what period the breeding activities of a single individual may cover. We are faced with the same problem in regard to other species which breed at two widely separated periods or through the greater part of the year, the Ground Doves of the genus *Columbigallina*, for example. Several possibilities are thinkable—the same individual may breed at intervals throughout the year, or she may have two widely separated nesting periods,

[1] G. K. Cherrie. A preliminary list of the birds of San Jose, Costa Rica. Auk, Vol. IX, pp. 322–329. 1892.

or each individual may have a particular season in which it nests year after year, while another nests periodically in an entirely different season—but for no single species, so far as I am aware, has the problem been definitely settled.

The nests of *Amazilia* are usually placed in trees or bushes in the clearings where the birds reside, without any distinct preference for any particular type. Frequently a thorny lime or orange tree is chosen, or a Bougainvillea vine, but as often a thornless kind is selected for the nesting site. Sometimes even a low herbaceous plant is favored. I have found their elevation to vary fron 2 to 20 feet from the ground. The open cup is constructed in a variety of situations, but almost invariably on some slender support. If some variety of citrus tree has been chosen, it may rest in the angle between an upright branch and one of its large thorns (Plate IX, fig.1), attached to both by cobweb, or in another kind of plant it may be placed in the axil of a slender leaf-stalk, or in the angle between a thin horizontal branch and a vertical stem. Sometimes a leaf alone suffices for its foundation. One of the most attractively situated I ever found was attached near the drooping tip of a large frond of the thorny peijabaye palm (*Guilielma utilis*), another was fastened to the palmately compound leaf of the Brazilian rubber tree, a third straddled the slender rhachis of the pinnately compound leaf of an akee (*Blighia sapida*), supported on either side by the opposite leaflets. At times the bird selects a very inadequate foundation. I once found a nest attached to a frail and decaying twig which in its descent from somewhere higher in the tree had caught on a horizontal branch and hung loosely beneath it, draped about with the fronds of a slender, creeping species of polypody fern which covered the bough and dropped in festoons below it. The one requirement of a nesting site is a horizontal support sufficiently slender to be grasped by the bird's feet—for from such a perch the building operations are always begun—close to some vertical or oblique support to which the side of the nest may be anchored. Frequently the nest is situated above or close beside a path along which people are constantly passing.

The nest is an open cup, formed exteriorly of weathered strips of grass, leaves, bits of weed, fibres and the like, and abundantly lined with soft, felted plant down, the whole bound together by cobweb

liberally supplied. The outer surface is tastefully decorated with gray lichens and green mosses, which sometimes are allowed to hang in long, waving festoons beneath it. Rarely, as in the nest I found on Barro Colorado Island, this ornamentation is very sparingly applied, so that the prevailing color of the exterior is grayish or tawny, from the fibres and down employed in its construction. Sometimes an otherwise beautiful nest is marred by a long piece of a withered grass leaf, used in building the foundation, carelessly allowed to hang beneath it. The eggs, which are invariably two, are laid on alternate days and are pure white, oblong or oblong-ovate in shape.[1]

The moss and lichen covered nests blend so well with the green foliage among which they are usually placed that it would be extremely difficult to find them, especially when the white eggs are hidden by the emerald bird, if the female sat more closely. The locations of several nests, which otherwise I should probably never have found, were betrayed by the birds' darting off as I passed within a few yards of them. The instinct which leads the birds to build a nest which blends so well with its setting lacks fulfillment in a corresponding instinct to utilize this advantage by remaining motionless. Perhaps at the approach of really formidable enemies other than man the female does remain motionless on her nest, but when most small creatures, lizards or birds even many times her size venture too near, she merely darts at them and usually puts them promptly to flight. Individual birds, however, differ greatly in the closeness with which they cover their eggs and young. One female, the closest sitter of all I found, whose nest was built in a young lime tree in a nursery where men were frequently at work, would allow me to approach within arm's length before deserting, to return within a few minutes and settle down on her eggs directly before me if I waited quietly at this distance.

II

I could scarcely have desired a nest located more conveniently for study than the first of this species I ever found. I was at the

[1] Dimensions of a typical nest: External diameter 1¾ inches, external height 1¾ inches; internal diameter 1¼ inches, internal depth ⅞ inch. Eggs (3 clutches measured): average 0.55 × 0.34 inches, largest 0.56 × 0.34 and 0.55 × 0.36, smallest 0.53 × 0.34.

time engaged chiefly in work with the microscope in a little frame building which served as office and laboratory at the now abandoned experimental station of the United Fruit Company beside the great Changuinola Lagoon, twenty miles from Almirante, Panama. On the afternoon of December 19, I raised my head from my work and noticed a Hummingbird, of a kind still unknown to me, perched on the petiole of a ramie plant (*Boehmeria nivea*) just outside the window, scarcely three yards from where I sat, and separated from me only by a screen. An oddness in her manner of perching attracted my attention, and looking more intently, I perceived something light colored almost hidden beneath her. When she flew off, I went out to examine her perch and found there a little tuft of plant down, fastened in the angle between the hairy petiole and the stem with cobweb, a piece of white thread, and several hairs from the cattle which grazed all about the small enclosure. During the succeeding days, as I sat at my work-table poring over bits of banana tissue, *Amazilia* labored steadily at her growing nest. The rite of adding a new bit of material followed an invariable routine. Returning with a tuft of down in her slender bill, she would alight softly on the incipient nest, push in the stuff where it was needed, and then proceed with the shaping of the structure. She bent down her head, and moving around and around, with her long bill shaped the substance to the contour of her body. As she pressed the yielding down more closely to her breast, she erected the bronze-green feathers of her crown, and her folded wings vibrated as though she thrilled in anticipation of the completed nest and the nestlings it was intended to cradle. Then she sat facing in a set direction, and from the way her body bounced up and down, I concluded she must be kneading the material together with her toes, although, being hidden beneath her, I was unable to see them in action. Sometimes she would dart away and then, as though the kneading and shaping had not been done to her satisfaction, return with empty bill to continue the moulding operations. So, as the nest grew, it became just large enough to fit snugly about the central portion of her body, leaving neck and head, rump and tail, protruding beyond its rim.

Hummingbirds of this species do not seem to have any prescribed order for the addition of the various elements of which the nest is

composed. This particular bird began with a wad of down, then bound around it strips of fibrous vegetable material, such as grass blades softened by partial decay, and fastened them there with cobweb. Others begin with strips of grass and banana leaf epidermis, adding the down later when they can get it. It seems to be merely a matter of convenience, or luck in finding the proper materials. I once found a nest built entirely of fine grass and pieces of weeds, but so devoid of lining that the eggs touched the branch on which it rested. This was doubtless because down for the lining was not available, and under favorable conditions the downy lining is added simultaneously with the fibrous materials which impart rigidity to the structure. Although the lichens and mosses appear to be merely an ornament of the nest, and do not constitute an essential part of the structure, they are often added before the foundation portions of the walls are completed.

As with other species of Hummingbirds, the female carried on all of her household duties without assistance from her mate. The two sexes are not distinguishable with certainty on the wing, but I never saw a single instance where two birds took an interest in the nest or its contents—unless indeed one was trying to rob it, as we shall describe later. By the twenty-second, the bird had made a good start, but during the ensuing four days the rain fell in torrents, soaking the unfinished structure, and during this period the builder made few visits to her work, and accomplished little. On the twenty-sixth, drier days returning, she resumed her work with renewed ardor until, twelve days after its commencement, the nest had been completed, and the first white egg was entrusted to it. She incubated the single egg sporadically during the following day but the next was not deposited until the second day after. The solitary mother brooded faithfully (Plate IX, fig. 2), and after sixteen days (the usual period) both eggs hatched.

The newly emerged nestlings were like ugly grubs, blind, black-skinned, and naked except for two lines of short, tawny down extending the length of the back, one on either side of the middle line. The slender bill of the adult was represented by a mere bump, hardly longer than that of a newly hatched Pauraque (*Nyctidromus albicollis*). At intervals one of the graceless creatures reared up spasmodically, opening wide its yellow-lined mouth in a voiceless

call for nourishment, to sink again exhausted, with drooping head, into the nest. The mother's time for the first week was divided between brooding and feeding her offspring, which she did in the customary manner of the family, by regurgitation. Sitting upright on the rim of the nest, she thrust the rapier-like bill into the nearest gaping mouth, pushing it down until it seemed that it must pierce the entrails of the nestling. Then with a convulsive jerking of the body she regurgitated a portion of the contents of her crop into that of her infant. Both nestlings were as a rule fed at each return to the nest, and often each was given food twice, alternately. When the nestlings are older, sometimes each is fed four times at a single visit of their mother. After feeding, she usually returned to brooding, repeatedly thrusting out her long, white tongue as she sat on the nest. Though during the day she flew off, twittering her complaint at my too near approach, at night she would permit me to advance and touch her on the nest, in the beam of a flashlight.

With these constant ministrations the youngsters grew amazingly, and at the age of six days, when the beady black eyes first began to peep out of the still-naked head, and the bill had lengthened considerably, they quite filled the bottom of their downy cup. The next day the eyes were fully open, and the tawny tips of the feathers began to protrude from their sheaths. When the nestlings reach this stage of their development, the mother ceases to cover them at night, but withdraws to perch at a distance. Before retiring on that seventh night of their lives, I went out to look at the nestlings, and to my disgust found their dead bodies swarming with small brown ants, the fierce, stinging kind called "Fire Ants" by the natives, which filed up and down the stem of the ramie plant, swarmed over the nest and fed on their flesh. I have little doubt that the ants attacked the nestlings while they still lived, for I had seen them receive food early that afternoon, and on another occasion witnessed still smaller ants attack living nestlings of Passerini's Tanager (*Ramphocoelus passerinii*). The swarms of ants continued to flow over the nestlings until their flesh was entirely consumed, and nought but a little heap of tiny bones remained in the nest.

Five days after this massacre of innocents, I was bent over my microscope when I heard a whirr of wings close by, and looking up,

LEFT.—NEST AND EGGS OF RIEFFER'S HUMMINGBIRD. THE NEST IS SUPPORTED BY A LARGE THORN OF A LIME TREE. TELA, HONDURAS, SEPTEMBER 7, 1930.

RIGHT.—RIEFFER'S HUMMINGBIRD INCUBATING IN A NEST SUPPORTED BY THE PETIOLE OF A LEAF OF THE RAMIE (*Boehmeria nivea*). ALMIRANTE, PANAMA, JANUARY 5, 1929.

noticed a Rieffer's Hummingbird pulling fibres from a soft hemp cord which I had left hanging from one of the slats of the shutter of my work window. Poised on vibrant wing, she pulled backward and away from the house, while her brilliant green throat gleamed in the afternoon sunlight, and her tail sent forth intermittent flashes of chestnut as she spread and closed it in controlling her flight. Then she darted away with the fibres in her bill, but soon returned and, poising before the deserted nest in the ramie, pulled out a billful of down. I followed her flight around to the small cashew tree which stands close beside the porch on the other side of the building. In a crotch near the top of this tree a new nest had been begun. The bird worked rapidly, tearing away large billfulls of down from the old nest and incorporating it into the new. She also hovered beneath the rafters of the porch roof, seeking strands of cobweb as binding for her nest, and paid repeated visits to the cord for fibres. The nest was completed and the first egg laid after a week's work. The second egg followed two days later, but for some unknown reason the bird failed to incubate, and for a week the eggs lay cold in the nest. Then it was attacked by a different Rieffer's Hummingbird, which pulled it to pieces, for the sake of the down it contained, to use in the construction of her own nest nearby. I feel confident that the bird which built this nest in the cashew was not the individual whose nestlings had been devoured by the ants, for she was occupied with a second nest in the same tree at the time the other was incubating her second clutch of eggs in the ramie.

Six weeks passed after the death of the nestlings, and all that remained of the nest in the ramie was its basal portion, a shallow cup of grass and fibres with hardly any lining, darkened and discolored by the weather. Then on March 4 I found a single egg resting on the hard, impacted base, but fresh bits of grass had been added to the walls around it, increasing their height, and new lichens decorated the exterior. Even after the second egg had been laid, on the following day, the bird continued to build up and line the old nest, until it appeared as solid and comfortable as when new. I suspect, from Hummingbirds' known attachment to their nesting sites, that it was the original builder returned to attempt once more to raise a brood in her old nest.

For the first few days after the eggs hatched, everything about

the nest proceeded normally, but even before the nestlings opened their eyes to the light of day, the first of a long series of tribulations visited them. The leaf on which the nest rested had in time died and become detached, but the nest, bound to the leaning stem with fibres and cobweb, merely pivoted around to the lower side, where it hung at an angle precarious to its tender occupants. I straightened it out and fastened it in place with pins. Other leaves above the nest fell a few days later, and the naked nestlings were exposed to the full glare of the afternoon sun. They sat with necks stretched upward, mouths widely gaping, and glassy, staring eyes. Once I saw the mother perch on the rim of the nest with wings partly spread, attempting to shield them from the sun's rays, but her position was not well calculated and her shadow unfortunately fell to one side of them, and they continued panting. Later she covered them on the nest, but one nestling, pushing its head out between her wing and body, continued to gasp. Fearing they might succumb, I attempted to arrange a shade, but I had not yet learned the toughness of young Hummingbirds.

When the first-born nestling was a week old, its body began to bristle with the pin-feathers and the eyes opened. By the following day the tips of the feathers began to protrude from their sheaths, and that night for the first time the mother passed the night apart from her offspring. The young birds had now become a trifle crowded in the nest, and the next day I noticed that the structure had begun to split downward from the rim. A few hours later I looked up from my work just in time to witness a most lively scene. The whole side of the nest had given away, dropping one of the nestlings to the ground, while the second was slipping down, but struggling desperately to crawl back onto what remained of its ruined home. Clinging by its feet, it attempted to support and raise itself by hooking its short bill over the remnant of the structure. The excited mother hovered above it, a piece of down held in her bill, as though attempting to save at least a trifle from the general debacle. I watched until the squirming nestling hung by a single foot, then hastened out to secure the dangling bird and pick the other uninjured from the ground, while the mother retired to the electric wire overhead and continued her distressed twittering. From a circular piece of brown paper I fashioned a shallow cone, which I tied to the

stem of the ramie as near the position of the fallen nest as practicable, and lined it with raw cotton. Then I placed the squirming nestlings in their artificial cradle which, after a little hesitation, was accepted by their mother, who soon returned to feed them.

I soon received a striking demonstration of the accuracy and persistency of a bird's sense of location. Returning to feed her youngsters, from force of habit the mother poised first in the position of the old nest, now completely fallen, then after a moment dropped to the artificial structure a few inches lower down. Even after visiting the nestlings several times in their new abode, she continued to hover first before the old position, neglecting for the moment the actual nest in plain sight.

I marvelled at the vitality of the young Hummingbirds. Exposure to the sun, a four-foot fall, repeated handling by fingers many times larger than themselves, had not killed them. Now a still more severe ordeal awaited them—twenty-four hours of rain with hardly a let up, and some beating tropical downpours in the interval. The mother had definitely ceased to cover them, and the scant foliage of the ramie which remained above the nest afforded slight protection. After a night of this severe punishment, I watched them through much of the dreary day. When the heavy downpours came, and the big drops beat ceaselessly upon them, the two-week-old birds sat in the improvised nest with eyes closed and bills pointing straight to heaven, shaking their heads from side to side when struck by a particularly large drop. Their budding plumage gave little comfort, and the cool rain soaked them to the skin. *Amazilia* attended them faithfully the whole day. At intervals between the heavy showers she came, her black bill dusted with the white pollen of the banana flowers in which she had been probing, perched on the rim of the paper cup, and fed her wet offspring. Often one or the other or sometimes both of the nestlings refused to accept nourishment, when she gently touched its bill once or twice with hers as though to coax it to take food, but often it was too wet and miserable to be tempted. At each visit she ran over the plumage of the nestlings, or a part of the nest, with her tongue, an act I never witnessed in dry weather, and from the way her throat worked, I concluded she was sucking up some of the excess water. And with these unfailing maternal ministrations, the un-

fledged birds pulled through the ordeal. Then I began to understand something of the secret of the wide distribution and great abundance of the species. Their nesting habits appear very imperfect, for the nest seems to sacrifice utility to beauty, and in a region where a large proportion of the birds build some sort of covered nest to protect its occupants from burning sun and beating rain, theirs is open to the sky, and moreover is too small to accommodate the two nestlings until they are ready to leave it. Their success as a species resides rather in the inherent toughness of fibre of the nestlings, coupled with the indefatigable attentions of the devoted mother.

Before leaving the nest, the fledglings acquired the plumage of the adults, although the colors were not so bright, and tufts of brown down still adhered to the tips of the green feathers, giving them a rather rough appearance. Two days before their departure from the nest, when I attempted to touch them they would ruffle up their feathers and attack a finger with their bills, which were still considerably shorter than the adult's. The first bird flew off as I was examining the nest, at an age of 21 days. The folded wings spread and began to whirr, in a moment it rose into the air and, uttering a low twitter as it went, flew away until it was lost from sight among the bananas. The maiden flight showed power and control. The second bird left two days later, aged 22 days. The mother continued to feed them by regurgitation for a number of days after their departure, but I am unable to state just how long.

The nestling period of these birds was perhaps a few days longer than normal because of the untoward circumstances attending it. In the case of another nest I watched in Panama, the nestlings took flight at the ages of 19 and 20 days, respectively. From a nest near Tela, Honduras, the nestlings departed at ages of 18 and 19 days, respectively, while from a second nest both departed at the age of 19 days.

III

Amazilia sits lightly on her nest, and a greater portion of her body protrudes above it than is the case with most other birds (see Plate VIII and Plate IX, Fig. 2). This is the outcome of the closeness

with which she moulds it to the central portion of her body, and then often continues to add down to the interior after the eggs have been laid, further decreasing the size of the cavity. The nestling, at the time of its departure, is almost as large as the adult, and naturally the two are very much crowded in the small nest (Plate X, Fig. 2). Before they depart, the wall is always more or less flared outward by the pressure of their bodies, while one or the other is forced to an uncomfortable position on the rim. Especially when the nest is softened by water during rainy periods, it is sometimes literally burst asunder by the pressure of the growing bodies it contains. In one case which came under my observation, the nest split down the side, then turned almost inside out and dropped its two helpless occupants on the ground. I found them next morning, after a showery night, in the grass beneath the ruined structure, among wandering fire ants which probably would eventually have devoured them had I not replaced them on the remains of their nest, where they sat a week more before they were able to fly away (Plate X, Fig. 1).

Two or three of the attempts to build a nest which I witnessed seemed to be the work of young or inexperienced birds, and were soon abandoned by the builders. On the riverwood tree growing beside the old lagoon behind our house I found a nest which had been started on a slender, unbranched horizontal twig. Since there was at that point no leaf or other lateral projection to prevent its slipping sideways, it grew into a lopsided affair and the position was abandoned as untenable. At another time I saw a bird try to attach material in the angle formed where the end of a leaf happened to touch a neighboring branch. The leaf slipped down and split the little wad, and the bird made a new attempt to build, equally futile, not far off. Doubtless these were the first ill-considered attempts of young birds to build.

A surprising aspect of the Hummingbirds' behavior, as I watched them near Almirante during the early part of the year 1929, was the persistency with which they pilfered material from each other's nests. Among birds which nest in colonies, from primitive species like cormorants and herons to highly specialized oropéndolas, the removal of material from neighbors' nests, either by stealth or by force, is a common and well known misdeed, but among species

whose nests are solitary, and there is probably no bird less social than the Hummingbird, the pilfering of nest material, so far as my reading and personal observation go, rarely occurs, and is never sufficiently prevalent to interfere seriously with the success of reproduction. Around our house at the research station, however, larceny of this kind was shockingly prevalent, and I believe that about half of the failures to rear a brood are to be attributed to this aberration of instinct. The condition was probably local and possibly even seasonal. It was induced to a large extent, I think, by the inadequate supply of down for lining the nests, added to the close proximity in which the nests were placed, sometimes 100 feet or less from each other, which made robbery easier than a long expedition afield to gather down. To this may be added the bird's passion for bringing more down to a nest which contains its full complement of eggs, and is already quite adequately lined. The balsa trees growing along the banks of the lagoon which ran in front of the house might have furnished excellent material, but the nearest of these was several hundred yards distant, and the long, prismatic pods did not begin to ripen and shed their masses of silky, resilient down, in which the seeds are embedded, until the peak of the nesting season had passed. Because of the shortage of down, eggs were sometimes laid in nests constructed entirely of pieces of grass and weed, ornamented with a few bits of moss and lichen, but devoid of any lining, which was added later as opportunity arose.

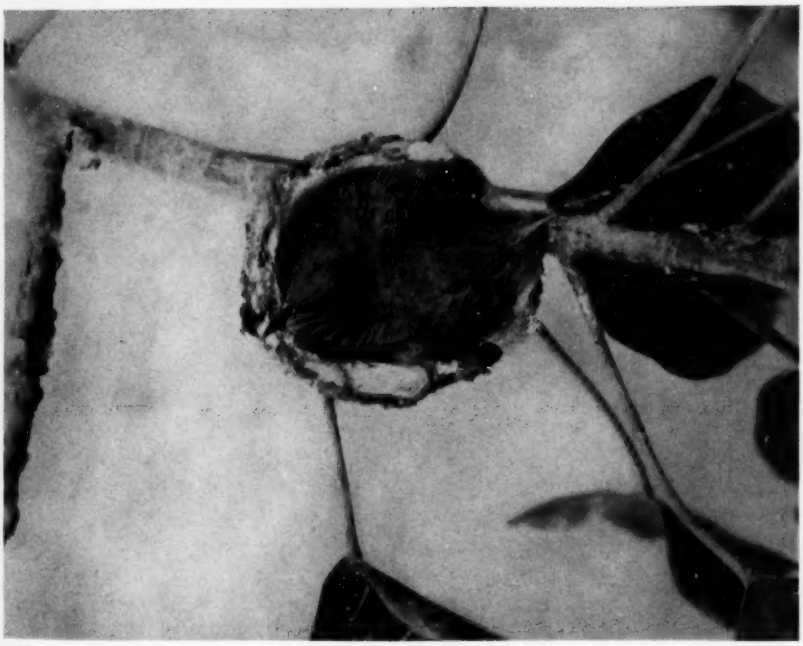
The presence of eggs in a nest did not render it sacred to other Hummingbirds. I have already mentioned the destruction of a nest which contained two eggs, but these eggs had been abandoned a week before another bird began to pull out the down for her own nest. A little more than a month later a second nest was begun on a lower branch of the same small cashew tree. Because of repeated depredations by another Hummingbird, this nest progressed very slowly; by the time the first egg was laid, there was only a very precarious bed to receive it, and it rested in contact with the limb. The owner continued to build up the nest around the egg, but the vandalism of the other bird (or possibly there were several) continued, until the egg, deprived of all support, fell to the ground and broke.

The bird which I finally caught in the act of helping herself to the ingredients of this nest had herself a remarkable history, and was the worst sufferer from the practice of pilfering with which I became acquainted. Her own nest, or rather the beginning of it, was situated in a crotch near the top of a gnarled and spreading cashew tree which stood in a corner of the lawn, about 50 yards distant from the last. The behavior of the bird, which I watched closely, seemed to indicate that she was young or inexperienced in the art of nest building. I first noticed a small tuft of fluffy material in the cashew tree on the morning of February 26, and later in the day witnessed the bird adding to it. The following morning all but a few shreds of the accumulation had vanished. On the next morning, again, I saw the bird carrying material to the same crotch, but by noon there was little to show for her efforts. I resolved to spend the afternoon in an attempt to clear up the mystery. Early during my vigil, the bird sat for half an hour on her mere rudiment of a nest, and a little later a freshly broken egg lay on the ground beneath the tree. Its fall escaped my notice. The bird had been so impeded in her building that when the moment for the deposition of the egg arrived she had no adequate nest to receive it, and it fell to waste on the ground. Thereafter, throughout the afternoon, she made frequent trips to and from the nest, each time bringing fresh materials which were added according to the usual routine. Having shaped the nest with bill and feet, she would fly to a twig not far off, pause there a few moments and then, apparently not satisfied with her work, return and repeat the whole procedure. Once she went through this performance four times in quick succession, without the addition of any new material. Frequently, too, she would hover beside the nest, remove some loose particle in her bill, then, alighting on the nest, return it once more to the structure. Once a bit of down fell away and as it wafted downward she darted from the nest, quick as thought, caught it deftly in her bill, and returned it to a place in the pile. At intervals she hovered before the blossoms of the hibiscus bush which stands nearby, or probed the little cashew flowers with the tip of her long bill, then rested for a while on one of its limbs. On the whole, she worked faithfully, but by four o'clock the result of her toils was a loose and untidy aggregation of fibres, bits of dead grass and down,

not yet worthy of the name of nest. Whatever had been taking advantage of her efforts failed to appear this particular afternoon, and as the sun was sinking low I went off, disappointed. I returned at sunset only to find that the marauder I had so desired to surprise had been busy in my absence. The crotch was almost bare and the bird, her maternal instincts again frustrated, perched stoically on a nearby twig.

For the next two weeks she continued her fruitless efforts to build. Doubtless she would have acted more wisely to have shifted the site of her endeavors to some distant tree or bush, but she showed the strong attachment to a locality characteristic of her kind. During the interval she moved the site of the intended nest to a crotch farther from the center of the same tree, then back to the old location, then once again to the new, but all to no advantage, and she seemed foredoomed to failure.

Later she began her nest among the branches of an avocado tree which grew close beside the cashew, but the change of location brought with it no change of fortune, and once more she moved back to her original site in the cashew. Here, one cloudy morning toward the end of March, I witnessed the most cunning act of thievery I have ever seen a bird perform. Time and time again I have watched Montezuma Oropéndolas (*Gymnostinops montezuma*) snatch long banana fibres from each others' nests, and even bills, but there was a straightforwardness in their manner which betokened an absence of guile. The present instance was different. The Hummingbird had just added a billful of material to her incipient nest—it never advanced beyond this stage—and darted off to pluck a lichen from the bark of a neighboring avocado tree. A strange Rieffer's Hummingbird flew up at this juncture and evidently observing the builder of the nest, which was in plain sight, perched on a twig low in the cashew tree. Here she sat so quietly that when the other returned she failed to notice the intrusion,—else she would without doubt have asserted her lordship over her domain—but calmly attached the lichen to the nest. No sooner had the unsuspecting bird flown off when the thief cooly advanced from her retreat and, hovering before the mass of down, pulled out a sizable billful and darted out of sight. When the owner of the nest returned, she continued her futile building as though nothing had gone amiss.



UPPER. RIEFFER'S HUMMINGBIRDS, 13 DAYS OLD, RESTING ON THEIR NEST (SHOWN IN PLATE I) AFTER ITS COLLAPSE. MARCH 25, 1929.

LOWER. RIEFFER'S HUMMINGBIRDS, 16 DAYS OLD, IN THEIR NEST IN A *Ficus religiosa*. TELA, HONDURAS, SEPTEMBER 8, 1930.

On another occasion a Tody Flycatcher (*Todirostrum cinereum finitimum*), the same whose nesting I described in an earlier paper,[1] made an inroad on this Hummingbird's accumulation of down. The Flycatcher happened upon it during the course of an exploration of the bark of the cashew tree for any cobweb which may have lurked in its crevices, to use in constructing his own nest not far distant, and when he came across this rich mine of suitable material did not hesitate to make the best of his find, returning twice to carry away more material. Thus a tuft of white milkweed silk, which I had seen the Hummingbird carry off from the nest of another, eventually found its way into the Tody Flycatcher's pendent nest. Since the material of the Flycatcher's first nest was employed in the construction of a second after the nestlings in the former met with disaster, and the second, found unsatisfactory, was torn apart to furnish substance for a third, it is interesting to speculate of how many different nests this tuft of milkweed silk may have formed a part.

For at least 31 days, according to my notebook, this long-suffering Hummingbird continued her attempts to establish a nest. I first made her acquaintance on February 26, her last attempt was observed on March 29. I have records of twelve fresh beginnings of her nest, each of which was more or less completely obliterated, and I have little doubt that she suffered many more reverses which I failed to observe, since her efforts to build were more or less continuous, and I made no attempt to chronicle all of her varied fortunes. She alternated between four different building sites, two in the cashew tree and two in the avocado which grew beside it, and made at least eight changes of location between these four positions, probably at least several more which I failed to record. As time went on, her behavior disclosed increasing bewilderment and distress. Often with empty bill she would return to the barren crotch where she had been building, and with feet and bill go through all the motions of shaping invisible materials to her body. She seemed to suffer a strong hallucination of the presence of the stuff she had previously added. Sometimes, after adding material in the usual manner, she began to fly off, but immediately returned to sit on it, then flew off and returned, for half a dozen times in

[1] Auk, Vol. XLVII, pp. 313–322. 1930.

succession, seemingly afraid to leave her nest unguarded. One morning she seemed undecided as to which of two sites in the avocado tree to entrust her efforts, for she went through all the motions of building in one, then flew to the other side of the tree and repeated the procedure in the other empty site, then back once more to the former. After several such alternations she at length settled on one, and continued to build there for the remainder of the day. Her efforts at a nest became increasingly lax, and her successive attempts were mere formless masses of the usual constituents. Likewise her instinct to defend her territory became benumbed, and she permitted Anis and other birds to rest on her premises. Finally, toward the end of March, her feverish efforts to perform her biological duty ceased, and no nest ever graced the gnarled limbs of the cashew tree.

The attachment of the Hummingbird to a particular nesting site is not usually quite so strong as that of the poor bird whose fortunes we have just followed. Usually, so far as my observation goes, the bird selects as its own a rather restricted area, and if the first nest is destroyed, builds again not in the identical site, but in a similar site a short distance off. The new nest may be begun less than a week after the destruction of the old.

About half of the failures to rear offspring which came under my notice at Almirante were, I believe, to be attributed to the thievish propensities of the birds themselves. At the height of the nesting season in February and March, birds would begin to build, perhaps get as far as laying one or both eggs, and then the nest mysteriously disappear. Although in most of these cases I did not happen to be present when the nest was broken up, it is hardly likely that an egg-eating animal would have carried off or devoured the nest, and in several instances, one of which I have already mentioned, the eggs were found beneath the ruined nest in a condition which indicated that no attempt had been made to consume them. A summary of the fate of the 17 distinct nests (not counting of course the many attempts of the bird which tried so long to build in the cashew tree) which I observed at the research station near Almirante, gives an idea of the tremendous difficulties under which the birds labored here. The much smaller number of nestings which came to my notice at Lancetilla, Honduras, were attended by much greater success.

	Almirante	*Lancetilla*
Total number of nests begun	17	5
Number of nests in which one or both eggs were laid	13	4
Total number of eggs laid	24	8
Number of nests in which both eggs hatched	5	3
Number of nests in which one egg hatched	1	1
Total number of nestlings born	11	7
Number of nests in which young were raised	3	3
Number of nestlings raised	6	5

Surprisingly small as it is, the number of nestlings which lived to leave the nest at Almirante would have been smaller still had it not been for my timely intervention, to which four of the six nestlings which survived owe their lives,—the two for which I made the artificial nest, and the pair which were picked up from the ground after their nest's collapse. Had I been the detached observer merely, the Hummingbird population at the research house would have been augmented by but two from all the seventeen nests which I found. Since two eggs are invariably laid in each nest if everything goes well, the total possible number of fledglings was 34. In reality, even if every bird had been successful in raising two birds in each nest, the actual increase in population would have been smaller than this, for many nests were made only because previous ones had been destroyed, and had success attended every nesting, there would have been a smaller number of nests. Mr. Woods[1] in his study of Costa's Hummingbird (*Calypte costae*) in California, found that only 19 young were fledged out of 29 nests containing eggs, or a possible 58 birds. This is a much better record than that of the Almirante birds, but not nearly so good as that of the much smaller number at the Lancetilla Experiment Station. Like myself, Mr. Woods saved an unstated number of nestlings by fastening up their nests, and here also success of reproduction would have been still smaller without human intervention. But I doubt whether it is possible, in studies of this kind, to form a just estimate of the actual success of reproduction of the species in any region. Those nests which are the first to be found by the student are probably just the ones most likely to be encountered by the birds'

[1] Robert S. Woods. The Hummingbirds of California. Auk, Vol. XLIV, pp. 297–318. 1927.

enemies, and hence give an exaggerated idea of the dangers which beset the nest. Those nests so well concealed that they escape observation would probably, had we any way of knowing their outcome, make a better showing.

A comparison of the results of Mr. Wood's study of Costa's Hummingbird with mine of Rieffer's Hummingbird indicates that the lengths of the important periods in the history of the nest are essentially the same in the tropical and temperate zone species. The normal incubation period for both is 16 days. The young Costa's Hummingbird remains in the nest from 20 to 23 days, Rieffer's Hummingbird from 18 to 23 days. Costa's Hummingbird, too, has the habit of laying its eggs before the nest has been completed, and some of the nests become broken down at the sides and flattened out before the young are ready to leave them.

3509 Clark's Lane,
Baltimore, Maryland.

SNOWY OWL MIGRATION[1]—1930–1931.

BY ALFRED O. GROSS.

(*Plate XI.*)

THERE was an unusual number of Snowy Owls reported during the winter of 1930–31. Because of the interesting relation the movements of these birds have with the cycles of life, especially of rodents, the chief food of the Owls in the north, makes it desirable to place this invasion of Snowy Owls on record. The last extensive migration occurred in 1926–27[2] when the visitors attracted wide attention from ornithologists as well as from the general public. At that time 2363 Snowy Owls were reported to us from the United States and this number represented but a fraction of those which made up that remarkable invasion. The bulk of the records of the 1926–27 migration came from the Great Lakes region, southeastern Canada, New England and south along the Atlantic coast to Long Island, New Jersey and Maryland. The migration during the past winter 1930–31 was not as great in magnitude at least in the numbers which crossed the borders of northern United States. However, 1313 Snowy Owls were reported to us this year from southern Canada and United States, whereas ordinarily there are but comparatively few records.

Dr. Ralph E. DeLury has found what appears to be a definite relationship of the eleven year sunspot cycle to rainfall, numbers of certain species of animals, annual growth of trees, etc. He has also called our attention to a four year period which he states is possibly related to the periodic fluctuations in mice and lemmings. It is interesting to note that this migration 1930–31 represents a four year period from the last migration and there is also a great probability that these migrations are prompted at least in part by the scarcity of mice and lemmings in the north. In reviewing the dates of Snowy Owl migrations that have been recorded it is seen that in many instances they have followed intervals of four or five years or multiples of that length of time. In this connection it is

[1] Contribution from the New England Ruffed Grouse Investigation.
[2] Gross, A. O. Auk, Vol. XLIV, No. 4, pp. 479–493. 1927.

extremely interesting to compare the dates of Snowy Owl invasions with those of the years of greatest abundance of Arctic foxes, animals which are also chiefly dependent on mice and lemmings for their existence. Mr. Charles Elton of Oxford, England, who has been gathering statistics of fur bearing animals in connection with special investigations conducted for the Hudson's Bay Company,

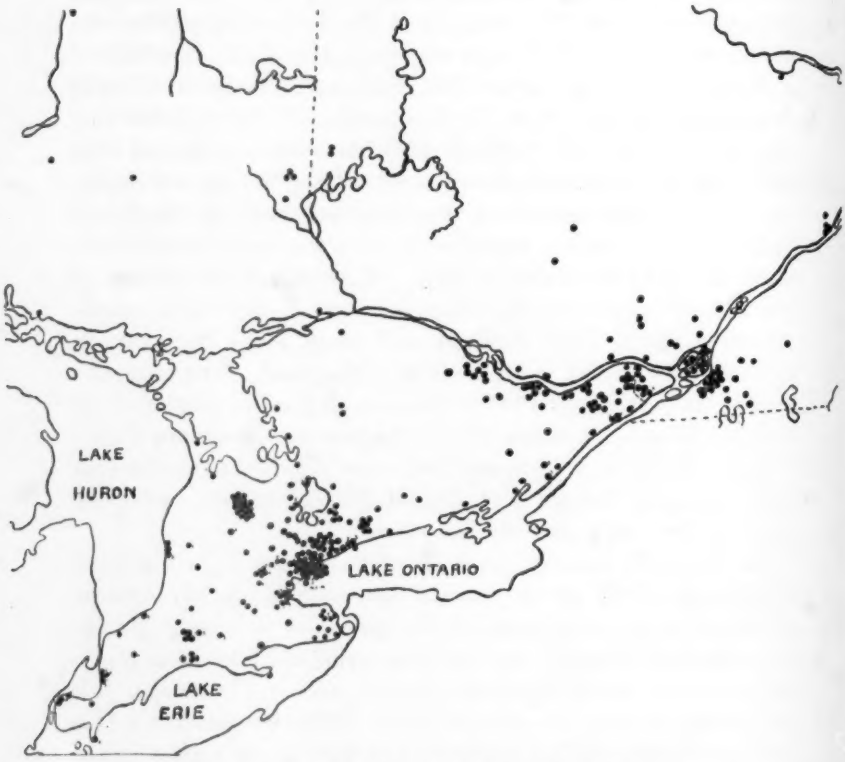


Fig. 1. Snowy Owl Records for Canada, 1930–1931.
From drawing by James H. Norton.

has kindly consented to give us the use of unpublished records of dates of maximum numbers of Arctic foxes collected at the Hudson's Bay Post at Fort Chimo. The years for maximum numbers of Arctic foxes shown in the following table, are according to Mr. Elton not the actual years in which returns were made but refer to

the previous year, the time of biological production. Since both the foxes and Snowy Owls are largely dependent on lemmings it is interesting to note to what a remarkable degree the dates of the Snowy Owl invasions and fluctuations in numbers of Arctic foxes synchronize.

The years of periodic maximum numbers of Arctic foxes	*Dates of Snowy Owl invasions as recorded in 'The Auk'*
1872	
1876	1876–77
1879	
1882	1882–83
1887	
1890	1889–90
1893	1892–93
1897	1896–97
1901	1901–02
1905	1905–06
1909	
1913	
1917	1917–18
1921	
1926	1926–27
1930	1930–31

In the above table the dates of maximum numbers of Arctic foxes at Fort Chimo as supplied by Mr. Elton are shown on the left and the dates of the Snowy Owl migrations as recorded in the Auk are given in the second column. It is possible that in the years when there were no Snowy Owl invasions corresponding to the Arctic fox four year maximum that a migration on a smaller scale occurred which did not attract sufficient attention of ornithologists to be put on record as a whole. This assumption is borne out to a certain extent by individual records of Snowy Owls published by newspapers and various ornithological journals in those years.

The four year cycle of the abundance of Arctic foxes and the corresponding regular periods of migration of the Snowy Owls are suggestive that some extraordinary influence is at work. The invasions of the Snowy Owls as well as the numbers of Arctic foxes are apparently dependent on the fluctuations of mice and lemmings and the latter in turn dependent on some regular cyclic condition

which might possibly be sun spots which affect the relative amount of ultra-violet light rays. Whether sun spots directly or indirectly affect the life of these rodents, through an influence on growth, reproduction or disease, is yet to be proven before it will be safe to state that sun spots are a basic cause of Snowy Owl migrations. At present it is merely an interesting theory.

Reports from Mr. P. A. Taverner and Mr. Bert Lloyd state that there were very few mice and lemmings in the vicinity of Churchill and Chesterfield on Hudson Bay during the summer of 1930. Mr. Taverner states, that the tundra in places was filled full of lemming holes but they were all old and of some hundred or so carefully examined not one was inhabited. He did not see a rabbit or hare during the entire summer and remarks that the Raptors had slim pickings on mammals in that section. The following notes contained in a letter from Mr. George Miksch Sutton concerning conditions on Southampton Island located at the northern end of Hudson Bay on Hudson Strait are of interest in the present migration,—"During the late summer and fall of 1929 these Owls were rare in the South Bay region, though a few nesting pairs were encountered in the Cape Low section. During the following winter (1929–30) however, the birds became extremely abundant—more so, in fact, than most of the Eskimos had ever known them to be—and we all thought this must be due to the great abundance of lemmings. Arctic foxes also were very common, and both foxes and Owls preyed upon lemmings to the almost absolute exclusion of Ptarmigan or other possible prey.—Dozens of nests were found or reported about the post. At one time I must have had twenty nests under more or less constant observation. All this was, I feel sure, a direct result of the abundance of mice. These mice on Southampton are now (1930–31) probably gone and the Owls have had to rove elsewhere in finding sufficient food." A peak in abundance of lemmings means a successful breeding season with a resulting increase in the number of Snowy Owls. If the peak of abundance of lemmings is followed by a sharp decline then the Owls are forced to wander long distances to the southward to secure food for their maintenance.

According to several correspondents the weather was very mild and comparatively light snows prevailed in southern Canada.

SNOWY OWL CAUGHT AT ITHACA, N. Y. PHOTOGRAPHED BY O. S. PETTINGILL, JR. EYES IN LOWER FIGURE RETOUCHED BY G. M. SUTTON.

These conditions were perhaps a factor in halting the southward migration so that fewer of the Owls than would otherwise have been the case crossed over to the states south of the Great Lakes. A very complete report of Snowy Owls killed or observed in Ohio has been received from Mr. Lawrence E. Hicks, Research Ornithologist of the Ohio Division of Conservation. He has obtained records of 126 individuals of which 51 were killed or captured. These records represent 82 localities and 34 out of 88 counties of the state. According to Mr. Hicks the 1930–31 invasion as represented in Ohio was about two-thirds as large as that which occurred in the 1926–27 invasion. It is evident from this report that the concentration of Owls in Ontario extended to a certain extent across Lake Erie to Ohio, chiefly to the counties directly south and southeast of the lake. Mr. Taverner voices the opinion that few of the eruptive birds that periodically come down south, ever return to their home grounds. If this be true the thousands of birds which migrated southward in 1926–27 and which were killed or failed to return so depleted the total Snowy Owl population that we could hardly expect a recovery to their former numbers in such a short period of time. The present migration though not represented by as large numbers nevertheless is just as important when considered from the standpoint of its basic causes and the correlation such a movement may have to cycles of life in the far north.

The New England Ruffed Grouse Investigation is greatly indebted to the Conservation Commissions who coöperated with us in gathering information by sending questionnaires to all of their wardens and to the more than one hundred independent observers who have sent in records and notes on the Snowy Owls and the migration. It is greatly regretted that mention cannot be made of each contributor who has aided in this report. I am especially grateful to Mr. Harrison Lewis, Chief Federal Migratory Bird Officer of Ontario and Quebec, who has sent us detailed records including dates and exact locations of 258 birds killed or observed in Ontario and Quebec, Canada. H' records form the basis of the distribution map of that region. I am indebted to Mr. James Norton for assistance in compiling the records and for making the maps.

The first information that was received concerning the Snowy

Owl migration of 1930–31 was in a letter from Mr. B. W. Cartwright who announced the arrival of the birds at Winnipeg, Manitoba. The first Owl made its appearance there on November 2

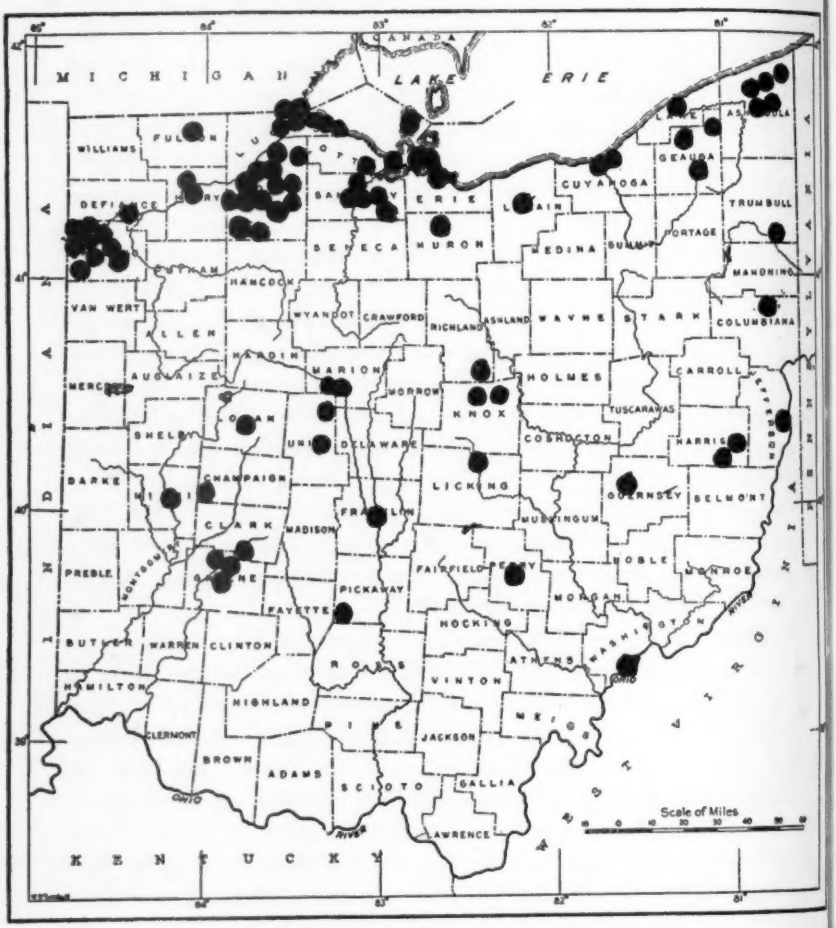


Fig. 2. Snowy Owl Records for Ohio, 1930–1931.

and on the next day 30 were seen on the delta of the Red River. On November 10 about one hundred were reported on Lake Manitoba. There were 536 records from the provinces of Manitoba

and Ontario which was the center of the concentration of the present migration. To the westward, from Alberta province there were fifty-two and from Saskatchewan only thirty-three records. In the other direction we have sixty-nine records from the Province of Quebec and only twenty-two from New Brunswick and Nova Scotia indicating a rapid thinning out of numbers toward the eastern portions of Canada. A few individuals (4) were seen in Newfoundland and according to Professor Alexander Meek a pair of Snowy Owls came aboard a ship two hundred miles beyond Belle Isle on November 2, 1930.

According to Mr. Hugh M. McLaughlin of Lewvan, Saskatchewan the first Owl appeared in that vicinity on November 8, 1930. The prairie about Lewvan has no natural trees and the Owls resort to straw piles which serve not only as observation posts but provide them with an abundance of mice. According to Mr. McLaughlin all of the Owls examined by him were extremely fat and practically all of the stomach contents consisted of the remains of mice. However, he observed the Owls chasing prairie chickens and in one instance a prairie chicken was followed to his dooryard and was so overcome with fright that it allowed itself to be captured and carried into the house.

Mr. C. L. Broley of Winnipeg, Manitoba also mentions the habit of the Snowy Owls making straw stacks their home during their winter visits to southern Canada. He writes that there are literally hundreds of mice about the stacks especially if the stacks are situated near a granary. He relates that he has frequently seen Prairie Chickens and Sharp-tailed Grouse fly past the Owls perched on the stacks but the Owls paid not the least bit of attention to them. Mr. Broley states that the Snowy Owl may kill Jack Rabbits when pressed for food but more often merely chases, plays or torments them out of pure mischief with no intent to kill. Mr. Broley examined 440 Snowy Owl pellets taken from the tops of straw stacks where the Owls were stationed and found the following: one pellet contained a foot and tarsus of a Short-eared Owl; three contained weasels; one pellet contained parts of a Ruffed Grouse; four the remains of gophers; one contained duck feathers but the vast majority (412) contained mice of various species which he did not identify. Mr. Broley sent me a number of pellets taken from

the same source. In one there were feathers and bones of a Canada Jay and in about thirty-five others there were fifty-three skulls and parts of the Northern Field Mouse *Microtus drummondii*, thirty-one skulls and parts of the White-footed Mouse *Peromyscus maniculatus* and a skull of the rare Least Weasel *Mustela rixosa* identified for us by Dr. Glover Allen of the Museum of Comparative Zoology, Cambridge, Massachusetts.

Mr. George M. Sutton writes that he found Snowy Owls living almost entirely on mice during the winter at Southampton Island but during the nesting season remains of a few small birds such as Snow Buntings and Horned Larks were found about the nests. Mr. Sutton never found the remains of a hare or Ptarmigan in the stomach or pellet contents of the species. On one occasion he noted a Snowy Owl killing a fox caught in a trap.

Mr. Cartwright sends the results of the examination of six specimens received by him which are as follows:

Age	*Sex*	*Weight*	*Stomach Contents*	*Locality*
Imm.	Male	3½ lbs.	3 mice and feathers of Ptarmigan	Manitoba
Imm.	Male	3¾ lbs.	5 mice, muskrat fur	Stonewall, Manitoba
Imm.	Male	4 lbs.	Empty, but very fat	Pigeon Lake, Man.
Adult	Female	4¼ lbs.	Rabbit's leg and foot	Bruno, Saskatchewan
Adult	Female	4⅝ lbs.	Ruffed Grouse feathers	Sioux Lookout, Ont.
Adult	Male	3¾ lbs.	Mouse fur	Winnipeg, Manitoba

Reports from Long Island and other points along the Atlantic coast state that the Owls have been observed to prey upon decoy Ducks and Ducks that had been wounded. From Wisconsin comes a report that thirty Snowy Owls were trapped on pole traps at the game reservation which is indirect evidence that they were there to obtain game concentrated at that place. These reports indicate that the Snowy Owls, will, under the pang of hunger, attack game birds when they arrive from the north but it should be emphasized that cases of destruction to birds are in the great minority. Their chief food consists of rodents and in the far north mice and lemmings are the very basis of their existence. When the supply of rodents fails the Owls are forced to migrate to the southward.

The tabulation of records reported to the New England Ruffed

Grouse Investigation reveals that the distribution covers an area similar to that included in the migration of 1926–27 but the concentration of birds was in central southern Canada and Ohio and

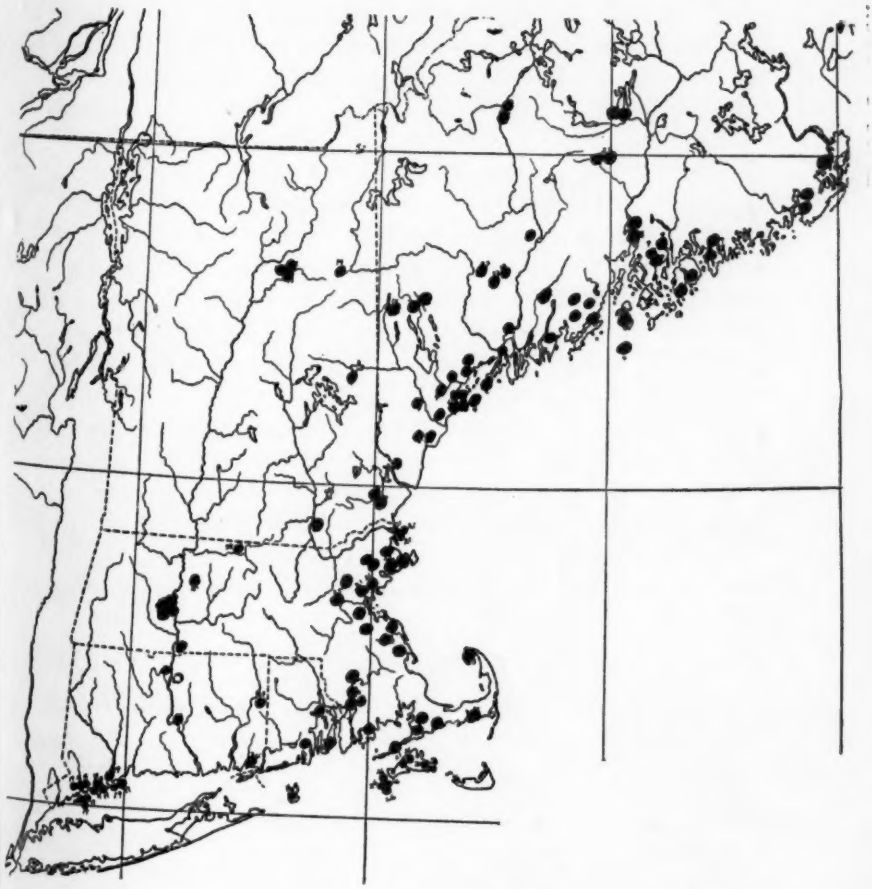


Fig. 3. Snowy Owl Records for New England, 1930–1931.

there were much smaller numbers in eastern Canada and in the eastern United States. The number of observers and similar sources of information were relied upon in obtaining records for the

1930–31 migrations as was used in 1926–27 hence the comparison of numbers is of some significance. In 1930–31 there were 2363 records from the United States whereas this year there are only 497 records of Snowy Owls, or one fifth as many. Mr. Harrison Lewis makes the suggestion that smaller numbers of Snowy Owls have been sent to taxidermists to be mounted during the 1930–31 migration than there were in 1926–27 because of the financial depression. Since taxidermists constitute one of our chief sources of records he concludes the numbers of records are much smaller than would otherwise have been made. The number of records from the southern states were greater than numbers reported from this region in 1926–27. There were two records from North Carolina, one from South Carolina and two from Georgia. Mr. Earle R. Greene reported one from Hall County, Georgia, December 31, 1930 and Ivan R. Tomkins shot one at Cockspur Island, Georgia, on February 8, 1931. These two records represent the southern limit of the present migration. An unusual flight of a Snowy Owl to Bermuda about 700 miles off the coast of South Carolina is also deserving of special mention. This Owl was first seen by Mr. L. L. Mowbray on December 28, 1930 and was again seen at Government House on January 28, 1931, during the reception given to the Prince of Wales. This is the third record for Bermuda according to Mr. Mowbray who took two birds, a male and a female in January, 1907.

DATES OF THE RECORDS OF SNOWY OWLS.

There were 756 records in which exact dates were given which were distributed as follows:

September	0	February	107
October	12	March	40
November	239	April	13
December	186	May	0
January	159		

As in the case of the 1926–27 migration it will be seen that in 1930–31 the largest number of Snowy Owls made their appearance during the month of November.

TABULATION OF RECORDS OF SNOWY OWLS 1930–31:

Canada	
Ontario	262
Manitoba	274
Quebec	69
Alberta	52
Saskatchewan	33
Nova Scotia	17
New Brunswick	5
Total	712
Newfoundland	
Newfoundland	4
United States	
Ohio	126
Wisconsin	81
New York	63
Maine	59
Massachusetts	53
Minnesota	44
Michigan	29
Connecticut	16
New Hampshire	7
Pennsylvania	5
Rhode Island	3
Georgia	2
North Carolina	2
South Dakota	2
Maryland	1
New Jersey	1
North Dakota	1
South Carolina	1
Tennessee	1
Total	497
Bermuda	
Bermuda	1
Grand total	1214 records.

Bowdoin College, Brunswick, Maine.

NESTING HABITS OF THE BLACK THROATED BLUE WARBLER.[1]

KATHARINE C. HARDING.

(*Plates XII–XIII.*)

THE following material has been accumulated during the past four years from the records of fifteen nests of the Black-throated Blue Warbler (*Dendroica c. caerulescens*) in Holderness, New Hampshire. The data regarding nesting sites and materials used is true of this region—but with different geographical surroundings or climate many variations might occur. Mountain laurel (*Kalmia latifolia*) grows abundantly on the heavily wooded slope overlooking Lake Asquam, where the Black Throated Blue Warblers breed. Every nest was built in a crotch of laurel. Twelve in dense laurel well concealed from view, and three in sparse laurel. Five nests were within twenty-five to seventy feet of the lake and the rest at varying distances further up the hillside—not exceeding a quarter of a mile.

Banding Record. Since 1926 I have banded twenty-six Black-throated Blue Warblers, twenty-one fledglings and five adults (four males and one female). Using the young as decoys, after they had left the nest, the adults were caught in a chardonneret trap. From this group I have had one "return"—a female whose nest I found in 1926 and again in 1927 about a mile from the previous site. She had a new mate in 1927.

Description of Nest. Height nine to fifteen inches. Inner diameter two inches. Outer diameter two and a quarter to two and a half inches. Inner depth one and a half inches. Outer structure: Usually built of thin strips of white birch bark and shredded inner bark fibres. Occasionally built entirely of shredded inner bark. Inner wall: Always composed of newly shredded inner bark fibres. Lining: Always made of fine black rootlets, with horse hairs when available. Skunk fur is used freely as a substitute and sometimes pine needles or bits of moss.

[1] Read at the Salem Meeting of the A. O. U. October 22, 1930. I am greatly indebted to Mr. A. C. Bent for taking the photographs of the female Black-throated Blue Warbler and nest.

Photos by A. C. Bent.

BLACK-THROATED BLUE WARBLER.
UPPER.—FEMALE INCUBATING.
LOWER.—FEMALE FEEDING YOUNG.

Nest Building. June 8, 1927, 12 M. As I was pushing my way through dense mountain laurel, five feet high in places, I saw a female Black-throated Blue Warbler fly into a small laurel bush ahead of me carrying a piece of birch bark. Focusing my eight power Zeiss field glasses, I saw a number of birch bark strips hanging between two prongs of the laurel bush. The female carefully arranged the new piece and flew off. On the slope overlooking the nesting site I found an excellent observation post, where I watched the progress of the nest from a distance of about twenty feet.

12.10 P.M. The male lit in the laurel bush and began shaping the nesting materials, using his feet and body. During the next half hour he made five trips, worked on the nest each time and twice brought cobwebs for it. When he was not at the nest he sang near by and guarded the area closely. He drove off another male Black-throated Blue Warbler from the vicinity with great fury.

The female worked constantly on the nest using great quantities of cobwebs, which she laced around the prongs of laurel supporting the nesting materials. She also used cobwebs freely in holding the strips of birch bark in position. When bringing cobwebs she averaged a trip every minute—but more time was needed to secure the strips of birch bark. Examined the partially built nest at 1 P.M. The bottom was composed of a thick layer of curling strips of white birch bark and half of one side (also of birch bark) was well shaped. No other materials except the cobwebs were visible at this stage.

3.45 P.M. Returned to my observation post. The female made fifteen trips in twenty-five minutes bringing cobwebs, which she used as before. She used her feet and body each time to shape the nest. The male did not approach the nest again while I was watching it until the young hatched although a male Black-throated Blue Warbler sang frequently in that vicinity.

From 4.30 to 5.05 P.M. the female made trips on an average of one a minute bringing cobwebs. She tilted forward at a sharp angle while working on the nest, and used her feet with a kicking motion. When disturbed by an unusual sound she remained motionless until it ceased. Examined the nest. The frame-work of the lower portion was well shaped. Inside the birch bark foundation was a firm inner wall of newly shredded, creamy, buff inner

bark which must have been built during my absence. There were quantities of cobwebs around the prongs of the laurel bush and in the nest.

June 9, 11 A.M. Examined the nest. The cup was definitely shaped and the inner wall of bark fibres had been thickened.

11.05 A.M. The female brought cobwebs then, withdrawing into the bottom of the nest with only her bill and tail showing, she revolved her body slowly in a horizontal plane pausing at ninety degree intervals to work and gaining leverage each time by pressing her tail down firmly, outside the rim of the nest.

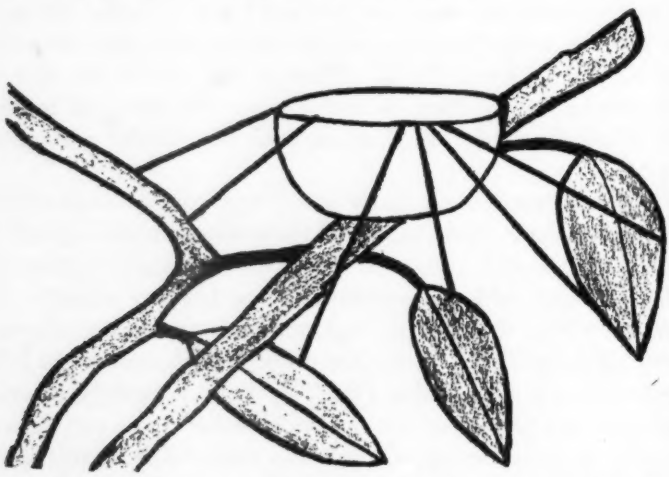


Diagram showing cobweb mooring lines holding nest in position during construction.

This operation was frequently repeated during the construction of the nest and I will refer to it in future as "boxing the compass." The female usually completed 360° sometimes pausing at ninety degree intervals and sometimes at sixty degrees. Two more trips were made for pine needles and shredded bark. At twelve o'clock, her usual feeding time, she stopped work. Examined the nest. The rim was quite firm but a glimmer of leaves could still be seen through the further wall. Quantities of cobwebs covered the entire upper part of the nest and the prongs of laurel supporting it formed a noticeable white film. The cup of the nest was still

pliable and bent in if pressed. Shredded bark was criss-crossed in the bottom of the nest.

June 9, 4 P.M. Between four and five o'clock the female made only three trips bringing cobwebs and "boxed the compass" four points each time. Examined nest. The female had begun to line it with fine black rootlets. The prongs of laurel had been freshly smeared with cobwebs and held the nest firmly in place. Cobwebs were also used as mooring lines, running from the rim of the nest to the leaves and laurel stems near by. It seemed as if they were used to hold the pliable nest in position while in the process of construction. Some cobwebs were two inches long and several four inches. As I bent over the nest I saw a puzzling brown hair hanging over the edge. Wishing to identify it I pulled and pulled until fifteen inches had uncoiled before my astonished eyes. It was mine! Much amused I hung it over a branch and went back to my post. A moment later the female returned to the nest, immediately noticed her lost prize and worked it into the lining again. Between 5.15 and 5.45 P.M. the female made six trips carrying bark fibres and rootlets.

June 10. Between 7.20 A.M. and 8.20 A.M. the female made nine trips bringing pine needles, rootlets and cobwebs. Examined nest, which was wet from last night's rain. The inner wall was much firmer than yesterday. The lining contained pine needles and black rootlets. It seemed about half finished. The cobweb mooring lines were still attached to the neighboring laurel stems and branches. New ones had been added and there were more on one side of the nest than the other. The nest was now a soft tone of creamy-buff and as I looked down from the slope above the lining of black rootlets made a dark oval like a shadow. Left my observation post at 8.30, having spent seven hours in watching the different stages of nest construction.

June 11. The nest appeared to be completed at 11 A.M. and was well lined with black rootlets and skunk fur. A number of spears of fox red moss with tiny club heads were also in evidence.

Incubation Period. After the nest building, which occupies about three days and a half, there is usually an interim of at least twenty-four hours before the first egg is laid. The female lays the eggs at intervals of twenty-four hours—frequently early in the morning.

So far I have never found a clutch containing either more or less than four eggs. There is considerable variation in both the coloring and marking of different clutches, as well as in individual eggs belonging to the same clutch. The eggs are ivory white with a blotched wreath of sorghum brown (Ridgway) chiefly around the larger ends.

On the morning of the fourth day when the clutch is complete the female commences incubating. The male sings constantly in the vicinity of the nest and sometimes alights on the rim and feeds her. She usually leaves the nest for at least half an hour soon after sunrise, between 12 M. and 1 P.M., and between 4.30 and 5.30 P.M., circling the nest as she feeds. Between these periods she often leaves the nest for brief intervals.

While incubating she varies her position—is very restless at times, moving her head constantly from side to side—or may remain almost motionless for a considerable period. She appears to turn the eggs with her feet.

I do not know whether the Black-throated Blue Warblers raise one or two broods, as we always leave camp on July 1. The first clutch of eggs is completed by June 5–9.

I also have a number of records of clutches completed on June 20–26. These are probably the second nests of birds whose nests have been robbed of eggs or young. The period of incubation is usually from twelve to thirteen days. One clutch of eggs hatched in eleven days.

CLUTCH OF BLACK-THROATED BLUE WARBLER'S EGGS
WEIGHT CHART FROM 6TH TO 10TH DAY, 1928.

Sixth	*Seventh*	*Eighth*	*Ninth*	*Tenth*
June 12	*June 13*	*June 14*	*June 15*	*June 16*
Grains	*Grains*	*Grains*	*Grains*	*Grains*
21	21	21½	21½	20½
21	20	21	20½	20
20	20	21	20	19
20	20	20½	19½	19

Hatching and Care of Young. When the young hatched I have seen two females dispose of the eggshells by crushing and eating them without leaving the nest— while a third female carried them away. A year ago I watched a female eat a cracked egg and its

highly incubated contents. The same female, aided by the male, disposed of a newly hatched dead fledgling in the same way. (Bull. Northeastern Bird Banding Ass'n., V, 1929, pp. 77–80). At nest No. 8 the young were three hours old before the male began feeding them. At nest No. 6 the young had been hatched six hours before the male appeared. At nest No. 2 the young were hatched at 6.30 A.M. and the male began feeding them at 8 A.M.

Type of Food. As soon as the young hatch the female begins feeding them. I have seen no evidence of regurgitation. She thoroughly crushes caterpillars, etc., between her mandibles before giving them to the young. Their food for the first day consists of small insects, soft white grubs and a large number of half inch, smooth, green caterpillars, which are found on hemlock trees. From the second to the eighth day their diet consists chiefly of small green caterpillars, insects, white grubs and an occasional may-fly or gray and cream colored caterpillar without spines. On the ninth and tenth day their diet still includes white grubs and green caterpillars, but dragon flies and may-flies are the chief staples. Slugs, winged ants, white cabbage butterflies and moths are also on the menu.

Disposal of Faeces. From the time the young hatch until they are five days old the parents swallow the faecal sacs. After that they carry them away from the nest and place them on the branches of neighboring trees—frequently using dead branches. I have watched four pairs of Black-throated Blue Warblers consistently dispose of the faeces in this manner—so it seems to be a fairly well established habit.

Signal System. The male's usual song is "Zwi-Zwi-Zwi" with an ascendant note on the last syllable. Both adults give the following alarm note, "thck-thck-thck" repeated in rapid succession when danger threatens the nest. There also seems to be a method of communication between mated birds. Sometimes while on the nest, the female gives a low pitched vibrant call "ss-hss-ss-hss" repeated quickly six to eight times. The male, although not within sight, will answer and come immediately to the nest. Occasionally feeding her, but not usually. He lights on the rim of the nest and they appear to "talk" to each other by opening their beaks very wide then closing and opening them again. At this time the

"ss-hss" call is not given and no sound whatever is perceptible to me at a distance of fifteen feet. This is also a fairly frequent occurrence when both birds arrive at the nest at the same time and have fed the young.

On one occasion the first time a male appeared at the nest after the young had hatched, he seemed to talk to the female before leaving the nest. The young gave a low buzzing call, when seven or eight days old, and from the ninth to the tenth day made a chittering sound when hungry.

NEST LIFE OF EIGHT DAY OLD BLACK-THROATED BLUE WARBLERS.

Date	*Time Eastern Standard*	*Number of times fed by*		*Number of times brooded by*	*Times faeces removed by*	
		Female	*Male*	*Female*	*Female*	*Male*
	A.M.					
June 26	4.16– 5.16	8	8	3	3	1
1927	5.16– 6.15	9	7	2	1	2
	6.15– 7.15	8	5	1	1	
	7.15– 8.15	6	5	1	1	
	8.15– 9.15	6	4	1		1
	9.15–10.15	12	10	2	1	3
	10.15–11.15	9	9	2	1	3
	11.15–12.15M	8	8	4	1	1
	P.M.					
	12.14– 1.15	2	2	1		1
		—	—	—	—	—
		68	59	17	9	12
Total	9 hours	127 times			21 times	

Plumage Development. June 19. The natal down of the newly hatched young was a quarter of an inch in length on the capital, spinal, crural and alar tracts. The color of their bodies was ochraceous buff. Their eyes were not open.

June 20. A few wisps of natal down were now visible in the caudal tracts of the day old young. The linings of their mouths and bills were ochre. Their eyes were not open.

June 21. The two day old nestlings were strong and active. Their eyes were not open and the color of the protuberant eye pouches was pea green. The natal down was still in evidence in the feather tracts. The developing feather sheaths were now

visible beneath the semi-transparent skin of the spinal tract resembling a double row of small evenly spaced dark blue splinters.

A similar "Blue Splinter" pattern had appeared in the upper portion of the ventral tract and a "Yellow Splinter" pattern in the lower portion of the ventral tract. The color of the wings was pea green and the posterior outline was slightly serrate.

June 22. The eyes of the three day old young were not open. Traces of natal down was still visible. The wings and spinal tract were pea green. The tips of the pin feathers of the primaries were separately defined. The outline of the secondary area had become serrate. The length of the extended wing measured one inch and an eighth.

The "Splinter patterns" in the spinal and ventral tracts were more obvious than yesterday and a similar blue pattern was also visible on the fledglings' legs above the tarsal joint.

June 23. The eyes of one of the four day old young were partly open. The natal down was nearly gone except for a few light wisps. No pin feather tips had appeared in the capital tracts. The pin feathers in the crural and ventral tracts were now separately defined.

The upper portion of the ventral tracts was pea green and the lower portion ochre yellow. The color of the spinal tracts and of the wings was pea green. The feather tips of the primaries and secondaries, which had burst through the skin appearing like miniature paint brushes were slate gray. The color of the wing quills was plumbeous. The color of their bodies and legs was ochre.

June 24. The eyes of all the five day old fledglings were open. Light wisps of natal down were still visible. Slate black feather tips were now unsheathed in the crural and caudal tracts. The wing bases were still pea green. The quills of the primaries were a quarter of an inch in length and the feather tips three eighths of an inch. The pin feathers of the secondaries were well developed. Also the feather tips of the greater wing coverts, which were slate black.

The feather tips of the ventral tracts were now unsheathed. The color of the upper portion was sepia and the lower portion Naples yellow.

June 25. The eyes of the six day old fledglings were well opened—but did not seem to focus properly. Faint wisps of natal down were

still visible. The feather tips in the capital and spinal tracts were now sepia, those in the crural tracts Naples yellow. The feather tips in the caudal tract were not yet unsheathed. The sepia feather tips of the primaries, secondaries and greater wing coverts were half an inch long. There was still a bare area of skin between the ventral tracts.

This was the last day I could handle the young without having them leave the nest. Their sense of fear seemed fully developed on the seventh day.

June 26. Examined the young from a distance of six feet. The four fledglings were very alert and lively, constantly flexing and vibrating their wings. The developing wing coverts and primaries still resembled minute paint brushes. The secondaries overlapped and partially concealed the bases of the primaries. The sepia feathertips of the caudal tract were now in evidence.

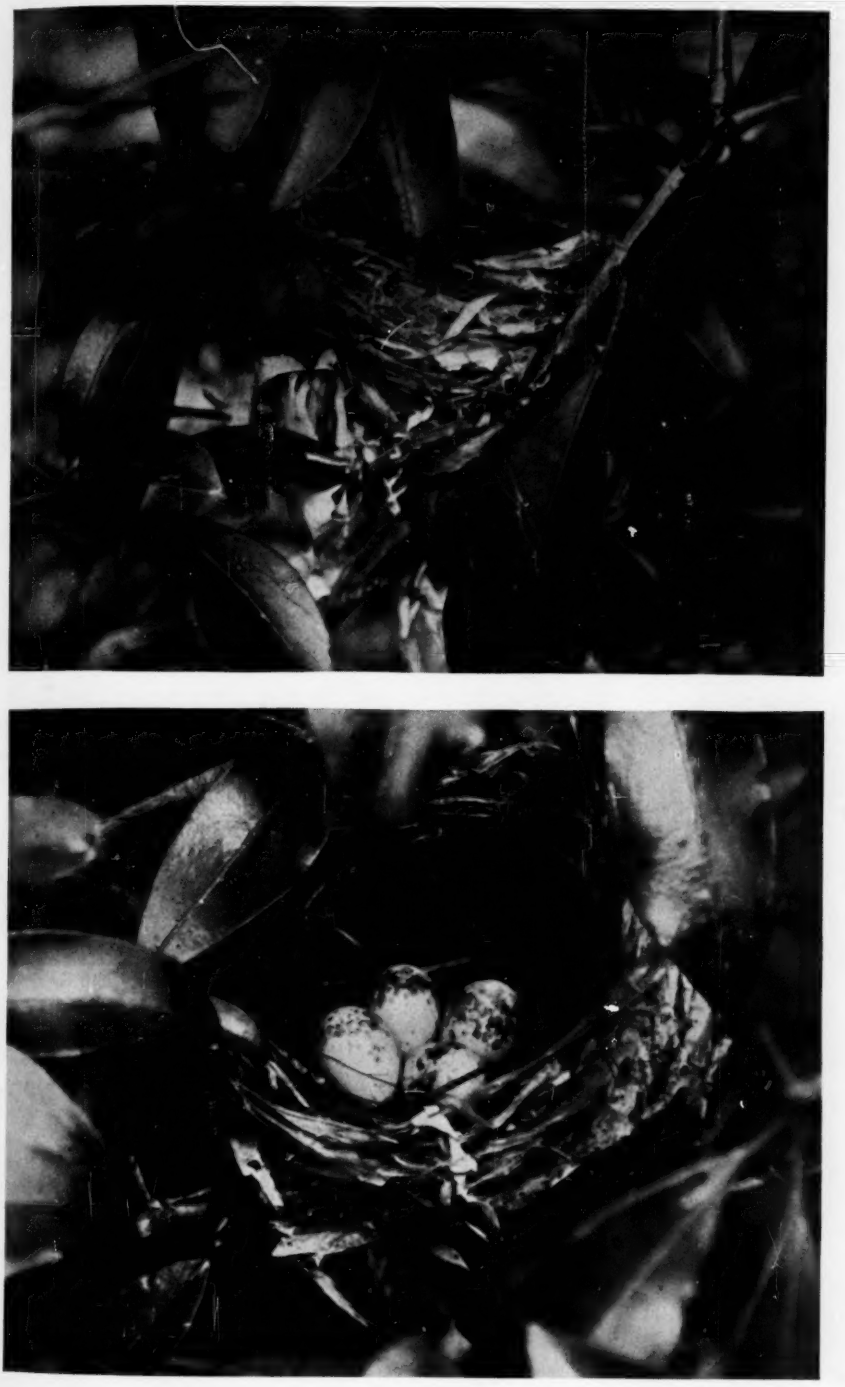
June 29. Tenth Day. The young left the nest. Examined them carefully. Their coloring was exactly the same, the only difference being that one of the brood was more fully feathered than the others.

BLACK-THROATED BLUE WARBLER FLEDGLINGS, WEIGHT CHART, 1929.

Newly Hatched	*Day old*	*Second*	*Third*	*Fourth*	*Fifth*	*Sixth*	*Tenth*
June 19	*June 20*	*June 21*	*June 22*	*June 23*	*June 24*	*June 25*	*June 29*
Grains	*Grains*	*Grains*	*Grains*	*Grains*	*Grains*	*Grains*	*Grains*
22	34	45½	66	89	107	131½	
24	36½	52½	76	95½	125	147	135
22	34	47½	70½	90	111½	141	142
	28	39½	62	76½	107		

BLACK-THROATED BLUE WARBLER FLEDGLINGS, MEASUREMENT OF LENGTH, 1929.

Newly Hatched	*Day old*	*Second*	*Third*	*Fourth*	*Fifth*	*Sixth*	*Tenth*
June 19	*June 20*	*June 21*	*June 22*	*June 23*	*June 24*	*June 25*	*June 29*
Inches	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
1⅛	1¼	1¼	1½	1¾	2	2	
		1½	1½	1¾	2	2¼	2½
		1½	1½	1¾	1⅞	2	2¼
		1½	1½	1⅞	1¾		



Photos by A. C. Bent.

NEST OF THE BLACK-THROATED BLUE WARBLER (*Dendroica c. caerulescens*).

Description of Plumage. Eyes; pupil dusky blue, iris blackish brown; line over eye straw color; mandibles straw color; mouth lining and tongue venetian pink; head and back brownish olive; upper breast and throat buffy olive; lower portion of breast Naples yellow; belly Naples yellow; undertail coverts Naples yellow; primaries fuscous black; secondaries brownish olive; greater wing coverts brownish olive; length of extended wing one and a half inches; length of primaries including quill and feathertip one and a quarter inches; length of feather tip three quarters of an inch; length of quill half an inch; tail brownish olive a quarter of an inch long; legs and feet flesh color.

Young Leaving the Nest. June 27. Entered the blind at 2.45 A.M. expecting the nine day old fledglings to leave soon after daybreak. Stayed there until 2.30 P.M. when it rained heavily until dark.

June 28. Entered the blind at 5.30 A.M. The four ten day old fledglings were very active flexing their wings and preening their feathers.

6.10 A.M. The male fed the young, hopped on to a horizontal dead laurel branch, which partially supported the nest and flew off. A fledgling on the rim of the nest watched his departure closely, then followed suit by hopping on to the same branch and fluttering to the ground (a distance of twelve inches). The male convoyed it through the dense laurel. The female continued feeding the other three.

6.40 A.M. While hunting parasites in the bottom of the nest, the female pushed the young aside and crowded one of them on to the edge of the nest. It hopped on to the same branch used by the first youngster and sat there for several minutes looking back at the nest as if uncertain whether leaving home was such a good idea after all. Finally it gave a little hop, overbalanced, hung with one wing over the branch for an instant, then dropped to the ground.

6.56 A.M. The female brought food and lit on a branch just out of reach of the young. They jostled each other on the rim of the nest, until the boldest one hopped on to the branch, received the food and fluttered to the ground. I picked up this youngster and took the last one out of the nest for examination of plumage and

weighing. So, after three years efforts, I finally succeeded in watching a brood of Black Throated Blue Warblers leave the nest under natural circumstances.

121 University Road,
Brookline, Mass.

THE NEW A. O. U. CHECK-LIST.[1]

BY WITMER STONE.

THE writer recalls very vividly the arrival of the original edition of the 'A. O. U. Check-List,' for which he had subscribed shortly after joining the Union in 1885, and the tremendous impression that it made upon him. He looked with awe upon the names of the Committee responsible for the work and thought that the height of his ambition would be to see his name inscribed as a member of such a body.

Having now served upon the Committee for a period of thirty years and taken an active part in the preparation of two editions of the 'Check-List' and a revised edition of the 'Code of Nomenclature,' this ambition of his early years has been abundantly satisfied.

And now upon the appearance of the fourth edition it seems an opportune time to say a few words about the 'Check-List' and its preparation and if these involve some very elementary matter he would beg the tolerance of those versed in the technique of check-lists on the plea that a large number of the readers of 'The Auk' know but little about the matter, and as some of these will doubtless constitute the personnel of future Committees, such information may be helpful. As to commenting upon a work for which the writer is himself partly responsible he claims as a precedent the reviews by the late Dr. J. A. Allen of the editions of the work prepared under *his* chairmanship—and after all who knows more about a book than one of the authors?

The main objects of the 'Check-List' as we understand it are (1) the establishment of a uniform nomenclature and (2) a statement of the range of each bird included in it. When the American Ornithologists' Union was founded there were three lists of North American birds in use—those of Baird, Coues and Ridgway, each differing more or less from the others in the number of species

[1] Check-List | of North American Birds | Prepared by a Committee | of the American Ornithologists' Union | Fourth Edition | Constituting the "Systema Avium" for North America | North of Mexico | Zoological Nomenclature is a means, not an end, of Zoological Science | Published by the | American Ornithologists' Union, | Lancaster, Pa. | 1931. Pp. i–xvii + 1–526. Price $4.00. Address, W. L. McAtee, Cherrydale, Va.

recognized, the names employed and the classification. Therefore the need of a single authoritative list was obvious in order that one writer might know what bird another was talking about, and so the 'A. O. U. Check-List' came into being.

Probably nine-tenths of the members of the Union, possibly more, are willing to abide by this standard list as they care more about the birds and their habits than about the technical names or the codes and rules governing their determination. There are others, however, who must of necessity deal with the latter problems and in some instances the problems, in spite of codes and rules, are open to different interpretations so that the names determined by a majority vote of the Committee which compiles the 'Check-List' do not accord with the personal opinions of some other ornithologist, and in such cases he may prefer to follow his own views. This is perfectly proper in technical papers or notes devoted wholly to some nomenclatural point, indeed it is such publications that furnish the groundwork for the Committee, when a new edition of the work is to be undertaken. We feel, however, that in general articles or notes published in 'The Auk,' in Federal, State and local publications, and in popular works, the 'Check-List' names should be used, as here uniformity of nomenclature is of vastly greater importance than the exploiting of personal opinion, since we have as readers persons interested in ornithology rather than in nomenclature. If anyone feels an urge to bring in some nomenclatural innovation in such connection let him remember Dr. Coues famous motto "Nomenclature is a means not an end of zoological science."

In this connection too, it should be understood that individual members of the Committee are, themselves, not personally satisfied with every name as set forth in the 'Check-List,' and every member has been in the minority on some of the votes. It would be impossible for it to be otherwise but it is a matter for congratulation that the cases involving serious difference of opinion have been few and where the vote has been a tie, or with a majority of but one, in the interest of stability no change has been made.

It has been argued that deciding nomenclatural and ornithological questions by a majority vote of a committee tends to make the results inconsistent and it has been suggested that a one man committee would be more satisfactory. There are many points in

favor of such a method but one man's decisions, consistent as they may well be, will be extreme in one direction or the other and might, perhaps, be not so generally satisfactory as the "average" decisions of a committee.

After this brief consideration of the origin and object of the Check-List let us turn to the innovations presented by the fourth edition, which is really almost a new work.[1]

The greatest change is in the adoption of a new classification based largely upon that of Gadow as presented in the preface to the last edition. This upsets the sequence of the orders, families, and species familiar to us for the last forty-five years. For example, citing the more striking changes: the Owls are removed from the birds of prey and placed close to the Goatsuckers; the Auks are taken from the vicinity of the Loons and Grebes and along with the Gulls and Terns are placed in close alliance with the Shore-birds and Plovers; the Hawks and their allies are placed farther down the scale, where they and the Gallinaceous birds come in between two groups of "water birds"; while the families of Passerine birds are entirely rearranged, the nine-primaried groups coming last and terminating with the Fringillidae. The classification as adopted was drawn up by Dr. Alexander Wetmore and Mr. W. DeW. Miller.[2]

Naturally we ask why such a change when the literature of so many years is based upon the old sequence? The answer is that even when adopted our former classification was a makeshift, and it is now quite out of line with well proven relationships which the present scheme clearly sets forth, and which are accepted in works dealing with the ornithology of other parts of the world. If we are not to revise our classification at reasonable intervals (and forty-five years would seem reasonable!) in the light of scientific discoveries and research, just as we revise our names, ranges, etc., then why have any classification? Some of us remember the overthrow when the original 'A. O. U. Check-List' came out, with the Grebes heading the line instead of the Thrushes, but we speedily out-grew the shock and the present changes are really not nearly

[1] Cf. also J. A. Allen's 'The A. O. U. Check-List;' Auk, 1903, pp. 1–9.
[2] Cf. Auk, July, 1926.

so drastic. Museum collections involving birds of the world have long since used a sequence entirely different from the old A. O. U. scheme and so have American publications dealing with foreign birds.

Another point in which the present edition differs from the last is in the abandonment of the binomial heading for each group of subspecies, i. e. *Melospiza melodia* at the head of the various Song Sparrows, all of which are regarded as subspecies because they intergrade one with another as we follow them from Alaska to California and eastward to the Atlantic. This binomial name introduced in the third edition proved to be more misleading than helpful as it was thought by many to indicate something different from any of the subspecies which followed it. The fact that *melodia* appears as the middle term of the trinomial name of each of the Song Sparrows should be evidence enough that they are a series of intergrading forms specifically separable as a group from the two other species, the Swamp and Lincoln's Sparrows. Our criterion between species and subspecies is intergradation and not degree of difference and as a matter of fact the great gray Song Sparrow of the Aleutians and the little rusty form of the Colorado Desert are so different that they would constitute distinct species were it not for the intergrading chain which connects them. It is claimed that it is inconsistent not to have a "specific" name for this series of intergrading forms, perhaps so, but nature herself is not consistent and it is difficult to interpret her work consistently. If anyone wishes to refer to Song Sparrows in general the name *melodia* is there to be used as a specific term if desired; the Check-List simply lists the "kinds of birds," species or subspecies as the case may be.

Changes have of course been made in the technical names where rendered necessary by the Code of Nomenclature, but in the great majority of cases these have been due to the subdivision or combination of old genera, or the subdivision of old species, involving a new trinomial name added to a familiar binomial. Relatively few changes are due to the operation of the law of priority which would seem to indicate that we have little more to discover in the field of "overlooked or unknown literature" involving the resurrection of long forgotten names.

While a few changes have been made in the vernacular names every effort has been made to keep them stable. The changes that have been deemed necessary are in cases like "Robin" and "Western Robin," where the former has been altered to "Eastern Robin," on the ground that this form has no exclusive right to the name "Robin." It should be noted too, that the apostrophe "s" is *still retained* in the case of birds named after persons.

Other innovations in the new edition are:

(1) More exact references to places of publication; the part, number, signature, or other division of a work, being now quoted with both the ostensible and actual date of issue, as nearly as the latter can be determined, while the several pages upon which a new name appears are all given. The reader thus has all the data before him.

(2) The citation of the type locality of nearly every species and subspecies is given in the exact words and language of the author followed by a restricted or translated type locality.

(3) Vastly amplified statements of range are presented with an attempt to distinguish the former from the present range where a change has taken place.

(4) At the end of the range of a subspecies, or group of subspecies, one combined statement of the range of such extralimital subspecies as may have been described is given, so that if one does not recognize the division into subspecies the range of the species as a whole is available.

(5) In the case of species described from America by Linnaeus, Gmelin, and a few other early writers, from the accounts or plates of still earlier non-binomial authors, such as Catesby, Edwards, Pennant, Latham, Brisson etc., the references to the works of the latter are also given, showing the source of the information and frequently of the names themselves.

(6) In cases where a species is included wholly on the basis of accidental occurrences the locality and date of each such occurrence is given with foot-note reference to the place of its publication.

(7) Numerous other foot-notes are given referring to certain races not recognized by the Committee or to suggested changes in nomenclature not accepted.

(8) The addition of a summary of changes in names with explanations, as well as lists of additions and eliminations as compared with the third edition. This is comparable to the Supplements previously published in 'The Auk,' but it was thought that this summary, covering so many years, would be of much greater service if incorporated in the 'Check-List' volume itself.

(9) The addition of a list of the numbers originally given to the species and subspecies and widely used as identification marks for eggs, etc. While these numbers are still retained at the end of the names the new classification has thrown them completely out of sequence, and this list with reference to the page upon which each will be found will be a convenience to oölogists. To renumber the species would cause serious trouble and confusion and render many identifications doubtful.

(10) The Hypothetical List has been enlarged to include all species at any time referred to it with their subsequent disposition, so that their record may not be entirely lost.

(11) The Fossil List has been amplified to include all recent birds which have also been found in a fossil state.

(12) The inclusion of naturalized species in the body of the List with distinguishing marks.

There are 1420 species and subspecies included in the present edition as compared with 1200 in the last, there having been 250 additions and 30 eliminations. Of the former, 50 are extralimital species now recorded from the territory of the 'Check-List,' 10 are introduced naturalized species (such forms not having been previously included), and 190 are newly described or revived races of which no less than 53 are from California and 40 from lower California. The number of genera recognized is 395 as against 382. Of these 12 were added through division of old genera while 12 were lost through the combining of old genera; 19 were added through occurrences of extralimital species in North America and 7 were lost through the transference of species to the Hypothetical List.

The question of the admission of additional subspecies will always be debatable. The Committee, following precedent, has only considered published proposals either for the recognition or

rejection of named forms and of the many cases considered approximately as many were rejected as accepted. The matter is wholly one of personal opinion and the only way to achieve anything like consistent results would be to have several ornothologists study the same material in each genus and let the Committee compare their conclusions. Perhaps some such arrangement may be possible in the future and the sooner it can be begun the better. The large number of additions to the present edition of the 'Check-List' is due mainly to the enormous amount of material from hitherto unexplored territory, notably Lower California, which has been accumulated during the past twenty years.

The preparation of a 'Check-List' involves more work than the users of the volume realize. In preparing the present edition the following plan was followed. A systematic list was first drawn up based upon the several lists of proposed changes that appeared in 'The Auk' from time to time, and upon other data subsequently gathered together and published since 1910, which included all suggested changes in nomenclature, descriptions of new species and subspecies, revivals of old ones, and proposed eliminations of forms already in the 'Check-List.' This list comprised upwards of five hundred items which were submitted to the members of the Committee in installments for study and vote, involving extensive examination of specimens and of literature. The votes when returned were then tabulated and the accepted additions and changes drawn up in proper form and typed. Then, with cut up copies of the last edition of the 'Check-List,' they were arranged in the sequence of the new classification, which had meanwhile been prepared by a subcommittee, and pasted on sheets while a preliminary revision of the ranges was made, and the type localities and references checked and amplified. In order to ensure uniformity in citations and abbreviations of titles a card slip was made out for every book and journal on its first appearance in the 'List' and every subsequent reference compared with it, while great care was taken to quote references and titles exactly—as to spelling (or misspelling!), capitalization, diphthongs, etc., etc., as well as to secure as accurate data on the actual dates of publication as possible.

The manuscript was then submitted to several members of the

Committee in the principal ornithological centers for further amplification of the ranges and other corrections or suggestions. Following this it was put into type and the proofs submitted to all members of the Committee as well as to twenty-two other ornithologists of the United States and Canada who had kindly offered to revise the ranges for regions with which they were especially familiar, the data of the Biological Survey being also generously placed at the disposal of the Committee.

The incorporation of the material thus secured and the revision—and often second, and third revision—of the proofs completed the main part of the work; after this the Hypothetical and Fossil Lists were compiled as well as the Summary of Changes and Additions and the Index, which contains over four thousand entries. One's respect for an index increases with the number which he has had to compile!

It may be interesting to know that the references in the 'Check-List,' numbering upwards of 2800, involved the examination of some 200 different works and ninety journals, published not only in America but in Great Britain, France, Germany, Italy, Russia, Sweden, Denmark, Holland, and Australia. Not a few of these are very rare and could only be consulted in the large scientific libraries, so that much correspondence was involved in securing detailed information from them.

The Committee feels that it has done the best that it could in the preparation of this new 'Check-List' and regrets the delay in its completion which was due to the fact that the members are all busy men with other duties occupying most of their time so that work on the 'Check-List' had to be done largely in their leisure moments.

The Committee consisted of Witmer Stone, *Chairman*, Jonathan Dwight,* Joseph Grinnell, Waldron DeWitt Miller,* Harry C. Oberholser, T. S. Palmer, James L. Peters,† Charles W. Richmond, Alexander Wetmore, and John T. Zimmer.†

The Chairman acted as editor and compiled the Hypothetical List, Summary of Changes, and Index, and made the provisional revision of the ranges and references. Dr. Wetmore compiled the Fossil List, Dr. Oberholser added data on ranges from the Biological Survey rendered available through the kindness of Mr. Paul G.

* Deceased.
† Appointed to fill vacancy.

Reddington, Dr. Grinnell revised the ranges of the Californian species, Mr. Peters contributed important data gathered in connection with his forthcoming check-list of the birds of the world, Dr. Richmond furnished much invaluable information on dates of publication and references, the result of many years' research in these lines, Mr. Zimmer revised the punctuation and typography and Dr. Palmer checked much of the index and verified many references. All of the Committee rendered important service in reading the proof.

Others who read proof sheets, revised ranges or furnished other aid were Glover M. Allen, R. M. Anderson, Outram Bangs, Charles F. Batchelder, Arthur C. Bent, Louis B. Bishop, Allan Brooks, James P. Chapin, Frank M. Chapman, James H. Fleming, Ludlow Griscom, C. E. Hellmayr, Arthur H. Howell, J. Eugene Law, Harrison F. Lewis, W. L. McAtee, Robert C. Murphey, John T. Nichols, George M. Sutton, Harry S. Swarth, P. A. Taverner, A. J. van Rossem and George Willett. Mr. Batchelder also checked the accents.

As one turns the pages of the 'Check-List' he seems to read, between the lines the whole history of American ornithology. In the names of the birds and the authors appear almost all who have contributed to our science, while the type localities recall the itineraries of the early and later explorers. One sees in the 'Check-List,' too, a sort of epitome of the work of the A. O. U. and cannot but realize its tremendous influence in welding the Union into the coöperative organization that it is today, while it emphasizes that accuracy of detail which has always characterized the development of American ornithology.

Like all of man's creations it has its faults but these should only serve to stimulate future Committees to greater efforts toward perfection.

The writer recently came upon a long forgotten chapter in Bradford Torrey's "Field-Days in California," devoted entirely to the 'A. O. U. Check-List' which is well worth reading and shows what a layman can find in this volume. Although, as a co-author of the work, he may be unduly prejudiced he cannot but agree with the remark with which Mr. Torrey ends his chapter, that "there's a world of good reading in a Check-List." Let us hope that other members of the Union will agree.

TWO-YEAR RECORD OF THE RUBY-THROAT'S VISITS TO A GARDEN.

A. L. PICKENS AND LURA P. GARRISON.

THE half-decade period beginning with 1925 and closing with 1929 saw records for heat, coolness, drought and moisture broken at various stations in the South Atlantic states. The weather records bristle with superlatives. For 1925 North Carolina reports a "record drought, especially in the mountains and upper Piedmont"; Georgia reports the season as "the hottest on record" while in the intermediate region "the most widespread and disastrous drought in the history of South Carolina" extended from the close of January to the first two weeks in November. Other dry years succeeded until 1928, and 1929 gave a precipitation to North Carolina the "heaviest of record except 1901" which record was in excess by only 0.6 of an inch; Georgia had the "highest rainfall on record," while in South Carolina the average precipitation was the "greatest of record" and remarkable coolness attended the rainy period and extended through even the drier months.

It is to be regretted that there were so few field observers in this area who kept systematic notes during this period. Bird migration appeared to be greatly affected, and high in the hills, as well as near the coast-plain, drought seemed to reduce the throng of migrating warblers both as to number of species and as to individuals. Whether they selected other routes, or flew on past at night, could only be conjectured.

Hummingbird records during the first three years were scattering and highly unsatisfactory. If early arrivals appeared in the spring, they were not likely to be supported by a satisfactory sequence of later arrivals, or the first record would be so late one felt it could not be the first arrival. Automobile trips to less desiccated regions at some distance showed more Hummingbirds in such places, possible migrants from the dryer territory. By the assiduous planting of red sage on the lawn, farewell visits from migrants were secured as late as October 5 for the first two years, and as late as October 6 for the third, but visits between arrival and departure were so rare as to disappoint detailed observation.

The farm surrounding the old Richmond church site in upper Anderson county, South Carolina, is highly favorable for Hummingbirds. Lichen-grown oaks afford fine building material for nests, wild flowers are found in forest, open fields, and along the well-watered valley below the church grounds, while not only the lawn but even a part of the vegetable garden are planted with flowers. Spring or autumn, it is not difficult to collect a floral spectrum. For two years a record of the Ruby-throat's visits to the flowers about the house was kept. Altheas, Gardenias, and Snow-ball flowers, with White Day-lilies have long supplied an abundance of white here, but with the first ageing, the last handicapped by several years of drought, demanding as they do moist, warm shade, the situation might have been more favorable for a test of whites. A greater number of visits could, of course, have been wished for, but with four adverse breeding years preceding, a decrease in the Ruby-throat is unfortunately to be expected. As it happened a record wet year, and the noted dry year of 1930 were included, and the first season was handicapped with a May which was "abnormally cool, the monthly highest temperature equalled the previous lowest May maximum temperature records." The records gleaned from notes and letters of the junior author follow:

1929:—First record at red *Fuchsia* in May; next on 31st at the purple *Buddleia.*

June 1, purple *Buddleia* and pink *Petunia;* June 5, purple *Buddleia* and pink *Petunia* in morning; *Gladiolus* and pink *Petunia* in afternoon; June 6, *Gladiolus* again visited in morning; *Gladiolus* and blue *Delphinium* in afternoon; June 7, *Gladiolus* and blue *Delphinium* in morning; June 9, Orange Lilies; June 14, *Gladiolus* and blue *Delphinium* in the morning, and both again in the afternoon. The purple *Buddleia* was next recorded; June 21, red *Fuchsia;* June 22, *Gladiolus,* pink *Petunia,* a corn-tassel, *Gladiolus* again, pink *Dahlia,* yellowish-pink Roses, red *Canna;* June 24, *Gladiolus,* blue *Delphinium,* multicolored Snapdragon with an orange appearance, and next a bunch of blue *Delphinium* held in the observer's hand; June 27, *Gladiolus* and blue *Delphinium.*

July opens with a visit to the Tiger Lily, three to the purple *Buddleia* follow, one each to pink *Petunia, Gladiolus,* and blue *Delphinium;* July 10, Tiger Lilies; July 11, Tiger Lilies again.

yellowish-pink Roses, *Petunia, Gladiolus,* and red *Hibiscus;* July 12, *Buddleia, Zinnia,* red *Hibiscus* and pink *Petunia;* July 15, *Buddleia;* July 16, *Gladiolus;* July 19, *Gladiolus;* July 31, two seen together for the only time, and they perched on the fence for the most of the period, but also visited the Tiger Lilies and *Buddleia.*

August 1, first recorded visit to red *Salvia;* Aug. 5, *Petunia;* Aug. 6, red Four-o'clocks and cardinal Cypress Vine; Aug. 10, Cypress Vine, and red *Hibiscus;* Aug. 11, Cypress Vine, red *Hibiscus;* Aug. 12, Cypress Vine and red *Hibiscus,* with a succeeding visit to the lavender Asters; Aug. 16, Cypress Vine and Mexican Cucumber, (*Momordica*); Aug. 18, red *Begonia,* and lavender *Lantana* visited in a neighbor's garden, four miles distant, where the birds are reported very fond of the latter, though they do not appear to care for it in the observer's garden; Aug. 19, red *Salvia.*

September. No record.

October. Probably a passing migrant; visited pink *Canna* and red *Salvia.*

The *Gladiolus* this season contained both reds and pinks. No choice was noted between the two. The *Delphinium* flowers were an intense blue.

1930:—April 12, at the red Japanese Quince; April 13, red and yellow Columbine; April 14, yellow Collard blooms. An additional visit by a Hummer is recorded for the Columbines. The hum of wings indicated the bird's presence there sometimes when intervening growth prevented its being seen. Such visits have not been entered with the others.

May. No record.

June 4, red *Gladiolus;* June 5, purple *Buddleia;* June 11, one came within reach, and carefully dipped into every *Gladiolus* regardless of color; June 13, *Gladiolus;* June 14, the bird poised almost in the observer's face to examine carefully the red picot edge on a frill of her dress. June 17, yellow *Gladiolus;* June 18, pink Sultana; June 21, the bird investigated the cover of the Woman's Home Companion for June as carefully as it had previously done for the red picot edging. The picture was largely red. June 24, red *Fuchsia.*

July. For this month fewer visits are recorded, but six flower records were secured: Pink Oleander, White Oleander, *Impatiens*

with white upper, and purplish-pink lower petals, Red Four-o'clock, red Standing Cypress, and the leaf of a fancy Caladium, both green and red, the latter color being tried with the bird's beak as if in quest of a floral nectary.

With July the record terminates.

Rainfall in the mountains for this summer was so low that it is doubtful if the birds gained sufficient relief by migrating there, perhaps the coastal regions were more acceptable, the absence of fall migrants being noticed.

Some facts recorded here are worthy of notice.

Each season opens with a visit to a flower of red, or largely of red, and each closes with visits to similarly colored flowers, while red has the predominant number of visits even after we take out the *Gladiolus* because part of them were pink, and eliminate the *Fuchsia* and the Columbines because the inner parts of these flowers contain, less conspicuously, purple in one and yellow in the other. This is all the more significant when we reflect how few reds occur among the native flowers. Eliminating the primitive conifers and the grasses, a floral calendar was constructed for common wild flowers that grow in the vicinity where this test was made. The percentages of each color follow:

Whites	26%	Greens	13%	Reds	4%
Yellows	21%	Pinks	12%	Maroons	2%
Purples	13%	Blues	7%	Oranges	2%

It is interesting to compare the results with some previous observations. Some results of color observations by *species* of flower have been given in "Favorite Colors of Hummingbirds" ('Auk,' July, 1930) but only 110 species were available for this List No. I. By adding all species known to be visited by any kind of bird, and supplementing personal observations and correspondence with names given in the literature this has been raised to about 250. This, List No. II, appeared, for the most part in 'The Condor,' January, 1931, and is of necessity tabulated by *species*, but the present List No. III, tabulates by *visits*, the reactions of a single species in a single locality, while the others are more general, neither, however, admitting any record outside of the United States and Canada. Bi-colored species, whose colors did not seem to blend as some one intermediate color have been divided between

the two colors represented, but less conspicuous inside colors, such as the red inside a yellow okra bloom or the yellow inside a red columbine, are subordinated to the more obvious color. The lavenders and lilacs are grouped as paler shades of purple. The results for the three lists follow:

Colors	I	II	III
Maroons		3	
Reds	45	82	34
Pinks	7	23	20.5
Oranges	15	23	9
Yellows	11	28	2
Greens	2	5	1
Blues	2	6	8
Indigoes	1	7	
Purples	19	32	11
Lavender and Lilac	5	6	2
Whites	2	31	1.5
Unclassified	1	4	1
Totals	110	250	90

Visits to objects other than plants are not recorded here.

For more than half the species a second visit is not recorded in the garden under test, indicating selective sampling on the bird's part, but while attracted by more vivid coloring, a rich nectary may count more than coloring. Other things being equal, a red, or orange, or some other intense color, gives a flower adapted to bird-pollination survival value over a duller or paler one, once tropical or other conditions produce a change in intensity. The Old World flower-visiting birds are not able to hover and feed as do the Hummingbirds, but must have a perch on which to rest. Thus a cosmopolitan genus of plants with delicately attached flowers, should show more reds and oranges in America than in the Old World. Something like three hundred garden forms were traced to their original homes using Bailey's "Standard Cyclopedia of Horticulture," (1914–1917), as an authority. The American reds and oranges exceeded those of the eastern hemisphere, almost three to one. All the reds in several genera originated in occidental Hummingbird territory. Of more than ninety species of *Salvia* all the reds, twenty in number, sprang from tropical or sub-

tropical America. In our arid southwest other influences appear. Thirst drives even larger birds here to drinking from flowers. Gorgets which one expects to be red like those of species met in the humid forests, here tend to purples and blues as if to contrast with yellow sands and dry vegetation. Purple and violet flowers rise in favor; the range of selective coloration broadens.

With the keen perception of color that is indicated by the splendid gorgets of the Hummingbird family, and no longer to be denied possibilities for transfer of pollen, the practical minded student with a penchant for seeking the useful among the beautiful, should seek to add to the harmful insects counted in the individual bird's crop, the few or many gorgeously colored garden treasures that the birds as a race have evidently developed from less attractive forms by unconsciously selective pollination.

Zoology Department, University of California.,
Berkeley, California,
March 30, 1931.

SOME CAUSES OF MORTALITY AMONG BIRDS.[1]

BY FREDERICK C. LINCOLN.

THE causes of bird mortality are of interest to every student of ornithology. That there is a large death rate from natural causes, such as predatory animals, storms, disease, etc., is axiomatic, and indeed, this must be so if the so-called "balance of nature" is to be maintained anywhere near its normal state. If every pair of breeding birds brought two nestlings to maturity, and there were no losses the avian population of the country would show each year a one hundred per cent increase. We know that this is not the case, as avian groups tend to remain fairly stationary or to increase very slowly. The reason is, of course, the control put by Nature upon undue increase.

The entrance of civilized man into the picture, with his far-reaching activities, adds still further hazards to the lives of birds, and at the same time removes or lessens others. Generally speaking it is believed that the existence of small birds in contact with the forces of civilization are fraught with fewer dangers than was the case when the entire country was in a state of primeval wildness. For example, very few species are denizens of the heavily forested regions, the preference of most being for the edges of clearings which man has vastly increased. Also man-made opportunities for the increase in numbers of the small species are many, while through intensive educational work and protective legislation man has done much to insure their safety. The widespread practice of feeding, particularly during winter or other periods of inclement weather, is likewise an important factor in preserving the lives of many feathered denizens of the wild. And finally, although indirectly, by the extensive destruction of fur-bearing mammals and other predacious animals, man has greatly reduced another natural cause of avian mortality.

On the other hand, many of the works of man or of domestic animals are agencies of destruction (although this is sometimes unintentional on his part), and it is interesting to ascertain, if

[1] Read before the American Ornithologists' Union, at Charleston, S. C., November 21, 1928.

possible, their relative status. Recently, upon examination of the data on banded birds received by the Biological Survey, it seemed desirable to prepare an analysis of the information there available that might throw light upon some death-causative agencies.

No attempt has been made to tabulate or analyze the mortality records that seem in any way traceable to the banding itself. These obviously are due to more or less abnormal conditions in the lives of our birds and so have no bearing upon the present report. It is gratifying, however, to record the fact that there are very few fatalities for which the banding work must assume responsibility. The only feature under this heading that has been at all troublesome has to do with the depredations of squirrels, shrikes, rats, and some of the smaller Hawks. Sometimes the Shrikes and Hawks (chiefly the Sparrow Hawk), apparently sensing the helpless condition of small birds in a trap, will enter and kill all the birds that it holds, at the same time becoming prisoners of the bander. Under such circumstances, the Biological Survey has recommended that the captives be banded and carried a mile or more from the station before release. Usually this action eliminates the annoyance from the individual offender. Occasionally, however, these birds will evade capture alive, and the use of a shotgun is necessary for the protection of the other birds. Under an order of the Secretary of Agriculture, every holder of a Federal banding permit is authorized to destroy Shrikes when in his judgment such action is necessary for the successful operation of his station.

The rodents taken in bird traps are undoubtedly attracted by the bait put in them for the birds, but when caught in the trap chambers they either kill birds deliberately or by trampling. Wherever, possible, "deportation" is recommended for squirrels and chipmunks.

The figures used in this report are as of November 1, 1928. During the period in which the banding work has been directed by the Survey more than 431,000 birds have been banded, which, with the addition of 22,500 marked with the bands of the old American Bird Banding Association, give a grand total of more than 453,000. From this record of nearly half a million banded birds, returns are available to the number of more than 24,500.[1]

[1] Since the above was written the grand total has grown to more than 900,000 birds banded, with about 52,000 return records. F. C. L. July, 1931.

In the present study it has seemed desirable to limit the research to the smaller land species, and accordingly the data for banded Quail, Doves, Hawks, Owls, Crows, Herons, Gulls, Terns, Ducks, Geese, and all other water birds, have been ignored. The balance, making up what we may term the "small land bird group," has a total of more than 304,200, with returns to the number of about 16,800. Of these returns, 2,426 represent birds found dead, and it is with these that we are now concerned.

In Table I, it will be noticed that there are listed thirteen causes of death, in addition to "Miscellaneous" and "Unknown" items.

TABLE I

Causes of Death

Shooting	561
Cats	245
Flying into windows, wires, etc.	67
Storms	70
Boys (airguns, slingshots, etc.)	60
Automobiles, trains, etc.	55
Traps set for other animals	52
Starvation	26
Drowning	19
Entanglements (strings, etc.)	11
Freezing	9
Poison	8
Scientific Collecting	7
Miscellaneous	100
Unknown	1,136

It should be borne in mind that the evidence used to classify these data, in some cases at least, represents merely the opinion of the person responsible for the report, while in others it is of a circumstantial nature.

At first glance the number of fatalities due to shooting (561) seems to be deplorably large. Possibly it is, but a further inquiry into the species represented reveals the astonishing fact that it is actually quite low. In almost all parts of the country Blackbirds, Starlings, and Jays are considered, if not game, at least as legitimate targets, and in some of the southern states the Robin must be added to this list, despite its protection under the Federal law. Some state laws provide a regular shooting season on Blackbirds.

If, therefore, the returns for all species of Blackbirds, Starlings, Jays, and Robins in this class (504) are substracted from the list, we have the insignificant remainder of 57.

Leaving now the top of the list and taking up for consideration the "Unknowns," it again seems desirable to eliminate the species just mentioned, which are found to total 617, leaving 519 cases to be scattered through the balance of the "Check-list of North American Birds." In deducting the Blackbirds, Jays, Starlings, and Robins from this group, it would appear reasonable to concede that while they were mostly "found dead," many had been wounded by shot, or in the case of the Blackbirds, poisoned. In examining further the balance of the group of "Unknown," it is found that it includes 280 cases of fledglings that died in the nest. Admittedly, the death of some of these birds may have been due to improper handling or other malpractice upon the part of the operator, but since in a great many instances supplementary evidence shows that the casualties represent only one or two from a brood of four or five, it seems fairly obvious that the banding operation was responsible for very few deaths.

The second item on the list in the opinion of the author is so serious that it far overshadows all other known cases of bird mortality. It is true that the evidence against the so-called "domestic" cat is largely circumstantial, but it is also overwhelming. I have personally skinned several birds recovered from cats and found in *every* instance that the cat was the actual killer and that it was not merely playing with a bird that it found already dead. Except for those highly bred animals that are valuable and are kept closely confined, *any and all cats* permitted to run at large, particularly at night, are hunters by instinct, and with regard to native birds are fully as inimical as the mongoose, against the importation of which we so carefully guard our ports. It would seem that nothing more need be said concerning this arch-destroyer, as the evidence is in, and but one verdict is possible.

The destruction of birds through impact with various objects is, of course, a well-known cause, and while the total shown in the table is not impressive, it is interesting to note the distribution by species. See Table II.

TABLE II

Banded Birds Killed Against Windows, Wires, Etc.

Purple Finch	19
Robin	9
Chickadee	6
Catbird	4
Junco	4
Chimney Swift	3
House Finch	3
Song Sparrow	2
Brewer's Blackbird	2
Starling	2
13 other species	1 each

The Purple Finch, which leads with 19 fatalities, has been banded in very large numbers and the casualties have generally occurred at or near the trapping stations. Windows have been responsible for the largest number, with transmission wires of all kinds a close second. In the case of window fatalities, observation has shown that these are most frequent in homes where two large windows are directly across from each other on opposite sides of the house. It is worthy of note that two of the Chimney Swifts were killed by flying against automobile windshields, while a banded Catbird flew through an open window of an automobile and was killed upon striking the closed window on the opposite side.

The item "Storms" may be passed over with little comment. Each year large numbers of small birds meet death in this way at the hands of Nature. Some are fledglings, killed in the nest by hail, sleet, or heavy rains, but adults are frequent victims. Some of the most interesting return records for small banded birds have been reported after a severe storm. In the autumn of 1926 several important recoveries of Song Sparrows, White-throated Sparrows, and Juncos were reported in the wake of a storm that caught the feathered travelers in southern Virginia and North Carolina. The birds had been banded mostly in New Jersey and the New England states. Heavy snows, long persisting, have caused the death of others through starvation.

Among unusual cases attributable to storms may be mentioned a Chimney Swift found badly burned at the base of a chimney, in Quincy, Illinois, that had been struck by lightning, and a Blue-

bird that had both wings broken in a terrific hail storm at Sioux City, Iowa.

Under the heading of "Boys" have been grouped those banded birds killed through the instrumentality of those time-honored weapons of youth, the sling-shot and the air-rifle. The score is not a particularly heavy one, and although all such acts are to be discouraged, it seems well to recognize this "reversal to type" that prompts the American boy to hunt. The list of victims includes 26 species and ranges in size from Chickadees to Black-crowned Night Herons. Here again, we find that Blackbirds and Jays constitute the bulk of the "game," the data showing 20 individuals of the former and 9 of the latter. Robins rank third with four specimens. Other species are represented usually by a single individual each, and include two Northern Flickers, one Red-bellied Woodpecker, one Red-headed Woodpecker, one Downy Woodpecker; two Purple Finches, one House Finch, one Junco, one Chipping Sparrow, one Tufted Titmouse, one Black-capped Chickadee, one Sparrow Hawk, two Mourning Doves, one Hermit Thrush, one Phoebe, three Brown Thrashers, two Catbirds, one Mockingbird, one Chimney Swift, and one Bank Swallow.

The latest hazard for birds, as well as for men, appears in the automobile. Fifty-five small banded birds have been reported as killed by cars on the highways or as being struck by railway trains. The Blue Jay heads this list with eight fatalities, followed by the Robin with six, and the Song Sparrow with five. The Chipping Sparrow and the Catbird are represented by three individuals each, seven other species by two each, and sixteen species by a single specimen. In examining these data it is noteworthy that the dates of recovery are mostly in the period from late spring through the summer season to October. It is in the early part of this period that birds lose much of their customary caution and in their fervid pursuit of one another dash back and forth across the highways, while later on the newly fledged young frequently congregate along the roads, where, lacking the skill and experience of their elders, they are not able to avoid the swift-moving traffic.

Traps set for other animals also have taken their toll of banded birds; traps set for rats accounted for 18, while mouse traps have been responsible for killing 12 others. Other traps have ranged all

the way from the rabbit box-trap of an old colored woman in Mississippi, through the small steel traps of the professional trapper set for weasels, minks, and muskrats, to the larger and more powerful wolf and coyote traps. The atrocious "pole-trap," set for Hawks and Owls, also has figured in this part of the picture. This is one instance where our "humanitarian laws" are sadly lacking, as this device should be generally prohibited by statute, as it is in New Jersey and in England. The species affected are chiefly those that are either noted for their curiosity or are terrestrial and more or less secretive in their feeding habits. The list is again headed by Jays (Blue, Steller's, and Canada), with 12 individuals, followed by Grackles with 8. The Song Sparrow is represented by 6 individuals; Anthony Towhee, two; Brown Thrasher, three; White-throated Sparrow, House Wren, and Blackcapped Chickadee, by 2 each; and the Magpie, Starling, Junco, Golden-crowned Sparrow, Towhee, Catbird, California Thrasher, Carolina Wren, and Robin, by single specimens.

The other causes of death noted in the list may be passed over briefly. "Starvation" has, in almost every case, represented birds that gained access to buildings from which they were unable to escape. Weather conditions, as previously mentioned, also have figured in the deaths of birds from lack of food. "Drowning" includes birds that have fallen into horse troughs, open cisterns, and in a few cases into bird baths improperly constructed. As one ornithologist has facetiously remarked: "They probably were drowned because of the weight of the bands." Drinking troughs for livestock have figured in the largest number of cases, and in at least one case the victim, a House Wren, was credited in the local press with a most remarkable flight. The accident occurred in eastern Washington and in announcing the fact, a local paper naïvely informed its readers that the bird had been released in Washington, D. C. Actually the bird was banded in the town where it died.

"Entanglements" include birds caught in strings or other nesting material, but it is proper to say that in only one case, that of a Purple Martin, was the band at all responsible. "Freezing" might properly be considered as a reasonable subdivision under "storms" as death usually has been the result of a sleet storm that later

changed to snow or ice. "Poison" is occasionally used by farmers to protect their crops from depredations of Blackbirds and others. The cases here considered are mostly Bronzed Grackles and usually may be traced to this cause.

Scientific collecting exacts a most insignificant toll if the records of banded birds offer a proper criterion. Only seven banded birds have fallen into the hands of collectors. Figured in terms of percentage, the collections of science from the ranks of the banded birds here considered (453,000) amount to 0.000015 of 1 per cent, or a little less than 0.0029 of 1 per cent of the total number of dead birds here considered. This record to be charged against the collecting permit should go far toward quieting the fears of the extreme protectionists who claim such great destruction of birds by collectors. The first specimen of a banded bird to be taken under a scientific collecting permit was a Piping Plover, banded at Chatham, Mass., by Charles B. Floyd, and collected near Charleston, S. C., by Arthur T. Wayne.

Turning now to the "Miscellaneous" item, we find a strange collection of death-dealing agencies. This list is headed by "Grackles," which are charged with the killing of six birds, mostly fledglings, although of equal rank is the farmyard "biddy," as domestic poultry also is credited with the death of six birds, these also being fledglings. Snakes have accounted for five birds, the tree-climbing black snake being the most frequent killer. Jays are credited with four deaths and lawn mowers for two. Two birds were reported as asphyxiated by gas or smoke, one a Grackle that was killed during the fumigation of a corn crib, while a Bluebird that perched on a chimney coping was overcome by the fumes. Chimney Swifts that came down chimneys in homes in Plymouth, N. C., and Warrenton, Va., were mistaken for bats by the terrified occupants of the rooms and were killed by them to prevent the supposed bats from getting "entangled in their hair." A banded Red-winged Blackbird became caught in a seine, while a Robin died from overindulgence in China berries. A California Gull (which is included in this report merely because of the exceptionally unique way in which it was killed) was hit in flight by a golf ball, and a Chipping Sparrow was caught and killed by a patient at a state hospital for mental diseases.

In conclusion it seems proper to add a word relative to reports of banded birds. It should be borne in mind that a banded bird is literally a "marked bird," particularly when in the vicinity of a trapping station, as the neighbors of such a station will almost unconsciously coöperate with the operator in maintaining contact with birds that wear bands. For this reason a dead bird, found on the lawn or in the yard of the average home that is ordinarily considered merely a bit of rubbish to be disposed of as promptly as possible, becomes an object that demands attention, and if found to be banded, for report to the station operator or the Biological Survey.

Biological Survey,
Washington, D. C.

LEFT.—NEST AND EGGS OF THE ALDER FLYCATCHER (*Empidonax traillii traillii*).

A STUDY OF THE HOME LIFE OF THE ALDER FLYCATCHER (*EMPIDONAX TRAILLI TRAILLI*).[1]

BY HENRY MOUSLEY.

(*Plates XIV–XV.*)

IN my "Birds of Hatley," which appeared in the 'Auk'[2] of January 1916, I ventured the remark, that it is only by nest hunting that one can gain any adequate idea of the abundance or otherwise of this species, as the bird is most secretive, and one rarely gets a good view of it in the open, which remarks I feel sure will be endorsed by most field ornithologists, although, few of them can agree as to the exact rendering of the song and call notes of this small Flycatcher, except, that they are unlike those of any other member of the family. In the present study, with one exception only, I heard nothing but an almost incessantly repeated soft, measured, and subdued "pip," the exception to this note being a soft whispered whistle, "pip-whee," "pip-whee," rendered on two occasions only, after the young had left the nest. In using the word secretive, I did not wish to imply that the bird was particularly shy, but rather, that its general mode of life low down in the undergrowth, made it appear as though it was so, but at the nest its behaviour, I think, certainly warrants the use of the word shy, at least, that has been my experience, as will be seen later.

The present study was begun on June 30 of this year (1930), and carried on with more or less ill luck until July 18. I arrived at Hatley on June 29, staying at the little bungalow I had occupied for so many years previously. In front of this, and just across the road, there was a field with a sharp declivity on one side and rise on the other. In the natural hollow thus formed ran a small trout stream, encompassed by a belt of alders 200 yards in length and sixty yards in width, amongst which was an abundance of spiræa bushes (*Spiræa latifolia*) in the forks of which the nests of this small Flycatcher were found, not only now, but in previous years as well. The first nest was located early on the morning of June 30, con-

[1] Read before the American Ornithologists' Union, Salem, Mass., October, 22, 1930.

[2] Auk, Vol. XXXIII, 1916, No. 1, p. 72.

taining four eggs, upon which the female was sitting, but she slipped off before I could get a view of her, the nest being two feet six inches above the ground in a spiræa bush. The second nest was found later on in the day, seventy-five yards south of the other, and contained one egg, the female in this case not being on the nest, which was situated two feet above the ground, also, in a spiræa bush. Two days later, or on July 2, this nest contained three eggs (when I photographed it, as being a good example of what the late John Farley calls the "stringing" down or projecting in various directions of the long narrow grasses), an egg having been laid each day before 8.30 a.m., and the following day, it contained four eggs. July 5, three of the four eggs in nest No. 1 hatched out, the remaining one being addled. The young at this stage, although blind, were covered with patches of dark brown down. It was at this juncture that my troubles began, for having obtained photographs of the three young birds and addled egg, which latter I then removed, I set the camera for taking pictures of the parents feeding the young, hiding myself in the surrounding herbage fifteen feet from the nest, whilst operating the shutter by means of a long release. It was half an hour before either of the parents ventured near the nest, and then it was another one and one half hours before one of them—no doubt the female—ventured to feed the young. It had been a long and tedious wait, listening to the incessant 'pip', 'p.p,' of the birds, as they flitted restlessly in the bushes, ever and anon buoying my hopes up by a near approach to the nest, always, however, to be doomed to disappointment, until suddenly and unexpectedly, as Farley describes it in his interesting paper in 'The Auk,' [1] of October, 1901, the female—presumably—appeared on the edge of the nest, and without taking any chances, I released the shutter and obtained my first picture of a parent at the nest with food, which, possibly, may be the first of its kind to be portrayed. Apparently, Herbert K. Job[2] was the first to obtain pictures of this Flycatcher from life, either in 1907, or 1908, but these were of the female incubating, since which time I have been unable to find any other study giving pictures of the parents at the nest, either with food, or feeding the young. After securing this picture,

[1] Auk, Vol. XVIII, 1901, No. 4, pp. 347–355.
[2] The Sport of Bird Study, 1908, p. 137.

and in view of the long absence of the parents from the nest and the tender age of the young, I decided to suspend operations for the day and wait until the morrow. As ill luck would have it, the morrow turned out badly, for it rained heavily and I was unable to visit the nest. On the following day, however (July 7), I spent three hours with the birds in the morning, the eyes of the young now appearing through long narrow horizontal slits. It was a long time after setting up the camera before the parents ventured near the nest, and when they did so, their shyness was even more exasperating than before. Time and again I would see the twigs quiver as one of them alighted near the nest, but venture on they would not, until at last, almost beside myself with the strain of three hours intensive watching, I lowered my eyes for an instant, and when I raised them again, it was to see one of the parents on the edge of the nest with its beak full of very small insects. It had come in the twinkling of an eye, and in a like twinkling I released the shutter, as I was afraid to delay an instant, in case it might slip off again before feeding the young, in which case, I would get no picture at all, as my time was more than up for returning home to Montreal. So far, things had not gone too badly, for I certainly had two pictures of a parent at the nest, and as I purposed returning in about a week's time, had prospects of others, not only at this nest, but at nest No. 2, also, which now contained four eggs, upon which the female had been sitting for three or four days. This was not to be, however, for on returning to Hatley on the evening of July 14, and visiting nest No. 1, the next morning, one young bird immediately left, not, on the thirteenth day after hatching, as did those recorded by Miss Cordelia Stanwood[1] in the 'Journal of the Maine Ornithological Society' for March 1910, but on the eleventh day. Having caught and replaced this youngster in the nest, it almost immediately left, before I had time to get a picture, and this it did again on being captured and replaced a second time. As the two remaining ones were asleep, and not wishing to spoil my chance of getting pictures of them, I let the other go, and never saw it again. The young were now similar in colouring to their parents, only, browner above, slightly more yellow below, with ochraceous buff wing bars. Scarcely had the other two been

[1] Jour. Maine Ornith. Soc., XII, 1910, No. 1, pp. 3–5.

photographed, however, than one of them woke up and made off also, leaving it to the last one to afford me the opportunity of obtaining some of the best pictures of the series, before it too left the nest. It was during this period of watching that the soft whispered whistle note, "pip-whee," "pip-whee," was given on two occasions, soon after the first bird had left the nest for the second time, otherwise, all that I heard as before, was the almost continuous 'pip,' 'pip,' of both parents as they flitted about, now in the alders, and then in the dense undergrowth, rarely giving me a good view of them. After the last bird had left, I took a look at the inside of the nest which was particularly clean, except, for the remains of one small beetle (*Corymbites aeripennis*) and about eighteen little stones, which I afterwards found out belonged to the fruit of the Red Osier Dogwood (*Cornus stolonifera*) which the birds had evidently been feeding to their young, as the shrub was growing on both sides of the gulley. The abrupt departure of these young birds was not the only disappointment in store for me, for upon visiting nest No. 2, it was nowhere to be seen, having been taken, no doubt by a boy from a neighbouring farm, who must have seen me photographing it on my previous visit, for another nest and eggs belonging to a Kingbird, had also vanished, the two having been photographed about the same time. It just seemed as if my study was at an end, until I suddenly remembered the title of a previous paper, "A Study of Subsequent Nestings after the Loss of the First," [1] so why not look for the second nesting of this unfortunate little Flycatcher. This I proceeded to do, but it was late in the afternoon before I located it, about 120 yards north of the first venture, and 45 yards north of the nest that the young had vacated earlier in the day. As before, it was in a small spiræa bush, two feet three inches above the ground, amongst some dead twigs and a clump of the Interrupted Fern (*Osmunda Claytoniana*), and at the time contained three eggs, similar in size and markings to those of the first set, the bird slipping off on my near approach. It was just five o'clock when I found this nest, and at that fatal hour, over fifty years experience with birds went to the winds, for I foolishly took a photograph of it, a thing which of course I should never have done, looking to the fact that the birds had already been robbed of their first nest and

[1] Auk, Vol. XXXIV, 1917. No. 4, pp. 381–393.

YOUNG ALDER FLYCATCHER ABOUT TO LEAVE THE NEST ON ELEVENTH DAY AFTER HATCHING.

set of eggs, which naturally should have called for greater caution on my part as to any lingering at, or interference with this second home; the more especially so, as one link in the chain of the reproductive cycle—that of egg laying—was on the wane, whilst the other, that of incubating, had only just commenced. Looking back on the event, there really was no immediate hurry for a photograph of this nest and eggs, and I should have waited until the incubating cycle was nearer its zenith, when it is questionable whether the birds would have deserted as they did at the present juncture. In years gone by, I can call to mind several instances of this species forsaking its nest merely from being flushed off it—apparently. The data obtained from this second nesting agrees very well with that recorded in my "Subsequent Nestings," the time occupied in building a new nest and laying a second set of eggs being ten days approximately, as against eleven, the second nest being in a similar situation to the first, whilst the eggs were of the same colour, shape, and markings as those of the first set, the distance of the nests from one another being 120 yards as against 66 yards the average distance as it worked out of the fourteen nests recorded in the above study. The favourite nesting site round Hatley is in the forks of a spiræa bush, only once have I found a nest in an alder tree, twice in nut bushes, and once in a wild gooseberry bush. The average dimensions of eleven measured examples are as follows, viz.: outside diameter 3½, inside 2 inches, outside depth 3½, inside 1½ inches. Like Farley, I have never seen a nest set snugly down into a crotch, it being always suspended and anchored by spiders' silk to the fork or independent twigs helping to form its support. This characteristic is well exemplified in some beautiful examples I presented to our National Museum at Ottawa several years ago when residing at Hatley, the general outside construction consisting of somewhat coarse dry grasses—some of which often hang down six or even twelve inches—the lining consisting of the same material, only very fine, with the addition sometimes of a few long horse hairs, one of which in the present instance measured 29 inches in length. In some cases the nests are quite slovenly, reminding one of a certain type of the Indigo Bunting, in others they are thick walled, deeply cupped, and compactly put together, as well as being much larger than the other type. The average size of ten

sets of eggs—most of which are in the above museum—is .71 x .53, whilst the average number in a set—in my experience—is three, the markings varying from very fine spots indeed, to quite bold ones, which often form an open ring round the larger end. The earliest date I have ever found a complete set, is June 14th, whilst the latest, is July 21st. In one instance, as already recorded in the 'Auk,'[1] the complete clutch consisted of two eggs only, such a small set having previously been recorded by Dr. Coues only, so far as I am aware. In conclusion, although so imperfect, it is hoped that the present study may have brought out points of interest to some, in the home life of these very unobtrusive and little seen flycatchers.

4073 Tupper Street,
Montreal, Canada.

[1] Auk, Vol. XXXIII, 1916. No. 1, p. 72.

QUANTITATIVE METHODS IN UPLAND GAME BIRD INVESTIGATION.[1]

H. M. WIGHT.

THE need of standardized methods in field investigation has been felt by many investigators and has been pointed out from time to time. For instance Graham (1929) states that "biotic information to be of maximum value, must be expressed in accurate comparable terms." One of the basic problems in game management is the development of methods by which a game census may be rapidly and yet accurately made. A satisfactory method must be both quantitative and standardized and the results should be expressed in birds per acre for each cover type and season.

The need for such a method was keenly felt by the author when in 1928 he undertook an investigation of Michigan's privately owned state game refuge system; a study conducted by the School of Forestry and Conservation, University of Michigan in coöperation with the Michigan State Department of Conservation. Naturally an attempt was made to utilize any methods which had actually been proven in the field, but a search of the literature failed to reveal that a comparable problem had been attempted previously. Several methods have been used, however, in estimating the abundance of animals, for instance, various means of taking bird censuses have been followed with more or less success, and these have been quite fully discussed by Dice (1930). The oldest of these consists of estimates indicating whether the birds observed at any particular time were "rare," "occasional," "common," or "abundant." More intensive methods have also been used, such as that of Forbes (1907) which may be called the strip survey method; the methods of Grinnell and Storer (1924); Linsdale (1924); and Kashkarov (1927), all of whom in one way or another have utilized the time unit as an indication of the abundance of various species of birds. Graham (1927) determined the nesting birds on one-acre plots by the songs heard during the early morning, a method also

[1] Contribution No. 20, School of Forestry and Conservation, University of Michigan.

advised by Cook (1923). Various investigators have estimated bird abundance during the breeding season by locating the nests.

It is obvious that none of these methods are suitable to use in making rapid and yet accurate counts of upland game birds. The first method of course is now antiquated. Such terms as "rare," "common," and "abundant," have little or no meaning when used by more than one individual. The strip survey by man, as well as the quadrat, and the count on the basis of a time unit, would prove entirely inadequate for this group of birds, because of their peculiar habit of seeking cover and not readily flushing, and the nature of the nesting habits of all of our upland game birds precludes the method based upon a count of the nests. The method of determining the nesting birds by listening to the early morning songs is used successfully in determining the population of cock ring-necked pheasants during the breeding period, but will probably prove unsatisfactory for the other species of upland game birds.

Game bird numbers may be determined during the winter months through a detailed examination of their tracks on a morning following a light snowfall, but this can be used only during the winter period and even then ideal days are too infrequent to make it reliable over extensive areas. The information required in this census was more comprehensive than simply taking a count of game birds, for the activities of predatory animals, the weather and soil conditions, the character of the type and density of the cover, proximity to ponds, streams and other waters, the economic and ecological trend, evidence of interest or lack of interest on the part of the owners, and many other factors, had to be taken into consideration and in addition it was necessary to make a cover map of each area. The areas averaged about one hundred seventy acres in size and one hundred nineteen were investigated between February and August. Under such requirements every available expediency must be utilized to facilitate the work and yet maintain a reasonable degree of accuracy. These requirements compelled the development of a new census method that would be both expeditious and accurate; and it is the purpose of this paper to discuss the method that was developed. The game bird count was made with the assistance of a bird dog, especially trained for the work, who combed the entire area. Records were kept of the hour when each

observation was made, temperature and general weather conditions, birds observed with number and sex when obtainable, type of cover, available food, and activity of birds and dog. From this information it has been possible to learn much regarding seasonal cover preferences of the different species, and the birds' reactions to various other environmental and physiological influences, all of which combined is, in the writer's opinion, the true function of a bird census.

The use of a dog in this type of work has many very obvious advantages. All of the upland game birds seek cover in which they quite successfully evade observation by either remaining quiet or through which they just as successfully move out of possible vision. The bird dog's remarkable ability to scent game, however, is almost infallible in detecting the game bird's presence. As an indication of the effectiveness of the dog in this work we may cite a typical instance when during eight hours the setter used in this work, accompanied by a pointer, hunted over a 2,000-acre plot and located one hundred sixteen birds. At another time in two hours the setter, working alone, located thirty-seven Ring-necked Pheasants and five covies of Bobwhite Quail in cornfields and heavy marsh cover, where it is practically certain that the writer working alone would not have flushed a single bird. Even under the most favorable conditions a man alone could find only a small proportion of the birds on an area; and those which he does find may be driven before him into unfavorable cover before they are seen, thus making the determination of favored cover difficult. Because of the incompleteness of such observations, an accurate determination of the size of flocks, the sex ratio, and the favored cover for each season is impossible by direct observation of the birds themselves. In using a dog for this work the birds are not driven out of their favored areas and much time is saved which can be utilized in recording the environmental conditions under which the birds are observed.

In this particular study the areas were completely covered by the dog, while the writer counted the birds flushed, recorded the data mentioned above and prepared a rough cover map of the area. Since the entire area in each case was covered in this manner this census may in a way be considered a modification of the quadrat method, in which the sample plots varied in size from ten acres to a

thousand acres. It may or it may not have been a representative sample for Southern Michigan, as the work was done entirely on game refuges, but the work illustrates the general practicability of this survey method.

It has been suggested that instead of covering the entire unit, a dog could be utilized in a wide strip survey more quickly and with equally accurate results. A careful comparison of the two methods indicates that provided the sampling be carefully made, that the dog be kept entirely within the designated strip and that the interpretation of the results take into consideration the relative acreage of each type of cover, both methods would yield approximately the same result. But in order for the dog to do satisfactory work in finding birds, he should possess the inclination to range wide coupled with a nearly infallible ability to locate birds. Such a dog will have a tendency to make wide casts carrying him far from the belt laid out for him to follow. The bird dog's tendency to seek good game cover would interfere materially with a fair sampling and the number of birds located for the miles traveled would not be comparable with the birds per unit area representative of the larger territory. Moreover the cross country method would take the surveyor far from his car and the return to it would require additional time and energy with the extra expense involved.

A practical application of this method may be made to smaller areas such as hunting preserves, experimental plots and game sanctuaries, or it may be used to estimate the game bird population on larger areas, such as townships, counties, or even the entire state. In the latter group sample plots would be necessitated and the population would be expressed in birds per acre of specific cover types, and converted into the total population in the area depending upon the relative acreage in various cover types. The population in the different types of cover would vary with the season in which the survey was made. In the survey of Michigan's privately owned state game refuges during the winter period approximately sixty-eight per cent of all Pheasants recorded were observed in marshes and swamps, whereas during a summer study comparatively few were found in these cover types.

It has been found that the use of a dog is particularly indispensable in an intensive study of experimental plots, where the exact

distribution of the birds must be known. This is well illustrated by much work on an area where birds were numerous and yet a day's observation without the dog did not yield the direct observation of a Pheasant, although the following day's work over the same area with a dog yielded a total of sixty Pheasants and twenty-four Quail.

Any method chosen may have its weak points and the method that has been discussed here is no exception. If every dog could possess the same ability to locate the same number of birds on any particular area, this method would probably meet any criticism that might arise, but such is not true. Dogs vary in their ability to detect the presence of birds just as field workers vary in their knack of seeing the same things on an area, but the dog depends very largely upon one single sense to locate game, although several other factors must be considered, which determine to some extent the difference between a good dog and a poor dog. Fortunately this remarkable characteristic to find game has been developed to such a high degree in the bird dog and over such a long period that it seems probable that the relative ability to find birds will be less variable in a bird dog than in man, and it appears that the bird dog will provide a relatively constant and very useful instrument in measuring game bird abundance.

It seems logical to advocate this method as a standardized means of obtaining quantitative information on the abundance of upland game birds, which can be expressed in comparable terms. In order that the sampling may be representative of the various types, it is advisable that a cover map be prepared in advance of the census work. Fortunately Northern Michigan is rapidly being provided with such maps by the Land Economic Survey, and it is hoped that eventually Southern Michigan will be cover-mapped. When these become available the problem of sampling and final interpretation of the results of a census for upland game birds will be greatly facilitated.

BIBLIOGRAPHY.

COOKE, MAY T.
1923. The purposes of bird censuses and how to take them. *U. S. Dept. Agri., Dept. Circ. 261.*

DICE, LEE R.
1930. *The Auk, Vol. XLVII, No. 1, January, 1930.* Methods indicating relative abundance of birds.

FORBES, STEPHEN A.
1907. *Bull. Ill. State Lab. of Nat. Hist. Vol. VII.* An ornithological cross section of Illinois in autumn.

GRAHAM, SAMUEL A.
1927. *Michigan Academy of Science, Arts and Letters, Vol. XI.* Ornithology and forest entomology.

GRAHAM, SAMUEL A.
1929. *Ecology, Vol. X, No. 2, April, 1929.* The need for standardized quantitative methods in Forest Biology.

GRINNELL AND STORER.
1924. *Animal Life in the Yosemite, p. 22. Berkeley, 1924.*

KASHKAROV, D. N.
1927. The quantitative method in the field study of vertebrate fauna and analysis of the data obtained. *Universitatis Asiae Mediae, Acta. 8a Zoologia; 1: 1–24.*

LINSDALE, JEAN M.
1928. *Condor, Vol. XXX, pp. 180–184.* A method of showing relative frequency of occurrence of birds.

MANNERS OF HOLBOELL'S GREBE IN CAPTIVITY.

BY F. B. WHITE.

A HOLBOELL'S GREBE (*Colymbus holboelli*), perishing in the snow in a field in Warner, N. H., January 27, 1930, was picked up by Warden C. B. Malchow and given to me by Mr. Parker, Game Commissioner. After its untimely demise, the bird was proved to be a female. This bird I kept in a small box, giving it each day half an hour to an hour or more in a bath-tub or in a metal tub three feet in diameter. As it fouled the water and the floor in a way that was very offensive, constant change of the water and of paper on the bottom of the box was necessary. Mr. Sim (*Wilson Bulletin*, 1904) seems to have kept his Grebe in a room in his house, but does not explain why this was not too offensive; Mr. Crosby (*Bird Lore*, 1913) kept two in a box-stall. Mr. Shelley (*Auk*, 1930) doesn't specify, but notes that his Grebe escaped over a partition eighteen inches high. I should recommend where possible a wire enclosure six feet square with an ample supply of straw that could be scraped out conveniently. Water ought to be available for swimming, in a pool or tub that could be easily flushed out.

Out of water my Grebe's customary position was sitting flat on its belly. The feathers of the sides then made a pretty border (white gray-barred, an inch or two wide) for the small triangular area that its wings formed, closed tight and small, coming to an acute point at the tail. White of the wings was never shown except momentarily when the bird rose erect and flapped them; but the white of the body-feathers was often conspicuous beneath the edges of the folded wings, along the sides and toward the tail. The feet were usually extended out at right angles, on line with the end of the tail. The neck was held well up most of the time when human beings were present to interest the bird and keep it alert; but at quieter times the neck would lie along the back as far as would go consonant with holding the head up. This was the common position in swimming:—duck-like. In sleep, the bird laid its neck flat to the back, drew down its head, and held its beak close against one side of the upper breast. At that time, its feet were drawn up forward under the wings so that legs and feet were com-

pletely hidden; a good deal of fidgeting seemed necessary to work them up gradually into this position and likewise to bring them down again. Except in the darkness of night, I saw this position assumed only once, and that was on the snow. The breathing in sleep was regular, deep, not rapid.

When the Grebe sat looking at what was going on around, the slender, fine lines of head and neck were extremely graceful and gave an air of pertness and intelligence restrained by dignity. This was a more comfortable companion than most birds captured in maturity that I have had because of its customary quietude—but it had its wild times.

Attempts to walk were humorous: they resulted in a few staggering steps ending in a lurch forward and a bump down on the breast. One time, out on the snow, the bird ran twenty-five feet, flapping the wings; I thought I had lost it, but the effort to rise proved vain. Its efforts to stand were at first abortive; an erect position could be held only momentarily, ending in bumping forward hard on the breast. After a few days, however, it learned to stand erect on the whole length of toes and tarsus, and subsequently this position was frequently assumed and maintained balance satisfactorily. Rarely would it flap its wings when out of water, and the support given to standing erect on the toes was only brief. When dry, the feathers were sleek and attractive in appearance; when wet, mussed on neck and head, except the front of the neck, which had the faculty of shedding water unfailingly. The slimy, sleeked-down look of the bird when taken out of a lively bath was ludicrous, shrunken and almost snake-like.

In the water, the customary movement of the Grebe was quiet paddling with strokes of leisurely kind alternating left and right. The legs were carried out from the body at a right angle, with depression of about forty-five degrees. As described above, the body-feathers formed a light border for the small dark triangular area of the folded wings. In turning around, the bird worked one leg vigorously and held the other still, acting as a rudder, so that the effect was as if pulling the tail around rather than driving the forward end; the motion of the paddle was a quick vibration, not strokes. To maintain itself erect it used this quick vibration, the feet set at an angle to the horizontal. Only twice did it tread water

in the proper sense. The vibrating seemed much more effective and gave a controlled position upright. This enabled the bird to flap its wings freely. A favorite movement was a lurch forward, humping up the shoulders, relaxing the wings, which lifted slightly, and raising all the feathers, instantly to be smoothed by a violent shake as the bird came to rest again in the water. Sometimes the bird would run the length of the bath-tub and back; this seemed to be accomplished by a combination of the vibrating motion of the feet with forward stepping; the wings were slightly spread.

The double stroke, which the bird had not space to indulge in freely, was of extraordinary power. This was witnessed under three conditions: when the bird was held under water, when it took a notion to escape from the bath-tub, and when it exhibited fear as a rare reaction the first thing in the morning. We were astonished at the force of the stroke when we held the body firmly under water; the complete muscular mechanism seemed to enter into it: the bird was all kick from head to tail. Secondly, the stroke was well exhibited in sudden mad impulses to escape by driving itself again and again up the sloping end of the tub, but happily this uncomfortable attempt was not often made, contented paddling usually being engaged in. Thirdly, the double stroke was exhibited in the small round tub when a sort of madness seized the Grebe for a quarter hour; then hurtling around and around under water wildly as if in terror, it would make pauses to bring its eyes to the level of the surface, then jerk its head down and resume the violent circular course. Why this conduct occurred at all, inasmuch as it occurred only twice, was odd. Perhaps the panic was caused by the restoration during sleep of a normal reaction that had been blurred by its varied tragic experiences of recent days.

The two elements of its life that afforded spectators most amusement were preening and eating. A thorough operation of preening was carried on when the bird was taken out of the water, which regularly cared for the lower part of neck, breast back to belly, part of belly included, body forward of bend of wing, sides and flank feathers below edges of wings. As for reaching for the oil gland at the base of the tail, this bird was rarely seen to do it, and then in a perfunctory way, with a quick dab. Very different was the conduct of another captive, which had come to earth in Concord, N. H.,

at Mr. Smart's, which would frequently be seen drawing the prominent gland deliberately upward through its bill.

In the water, preening was carried on between intervals of quiet paddling. For the breast and forward part of belly, the bird, heaved over on its side, sustained a position on its side long enough by violent strokes of one foot to make a few darts with its beak through the feathers, digging vigorously and reaching a little beyond the middle line. For the sides, the bill was driven along at the edge of the wings and just under the edge. For the back, the bill was passed along between the wings, but this was rarely done. Feathers of back and wings were laid smooth by the forward lurch and shake described before, on water as on ground. This operation was usually followed by lively dippings of the bill to sprinkle the back, which was then rubbed by the closed bill and by the side of the head used like a brush, with quick spasmodic strokes. Rarely it scratched the back of its head with a claw, or by backing against my finger and then wiggling its head. Rising erect and flapping the wings has been referred to above as done on the ground and was likewise done on the water. It seemed part of the preening, but may have displayed merely a desire to stretch the muscles.

For food, I experimented with raw beef shredded up, but in vain. Live goldfish were welcome, but were diminutive and extravagant at the price. Smelt, four to six a day, constituted the diet; they were from six to seven and three quarters inches long. One lot that was decapitated made the bird trouble because the blunt end would not slip down well and fragments would stick about the bill, resulting in a great deal of uneasy thrashing and knocking on the ground. Scraps it would leave lying around but never a whole smelt (except for two days when it definitely refused food). The fish would be seized across the middle and moved in the bill till the head pointed down the throat, then swallowed with no special exertion, merely four or five scarcely visible gulps. Sometimes a tail protruded from the bill a minute or two. A very big smelt or a frozen one would be vigorously bitten just back of the head and along the spine a short way. With the large ones, there was a motion of the bird's head not forward and back nor up and down, but a combination of the two, vigorous but not violent. The anxiety was all on the part of the spectators. Even a decapitated smelt

slipped down with no trouble, after a sound pecking and thrashing to improve the shape of the blunt end. If two smelt were given inside a half hour, the first went down quickly, the second slowly. It happened that on one occasion the swallowing of a second smelt was followed by a period of quiet ending in evidences of concern: "It's coming up again!"—and it was. The tail of the fish slowly worked up into the bill. Suddenly the bird began a series of violent quick sideways swings with the head, nearly completing a circle, and snapped the fish out two or three feet. Live goldfish were taken with sharp darts of the bill; one was seen to slip through but was taken on the second attempt. Only two small feathers were shed by this bird while I had it; one of these it ate.

The notes heard from this Grebe were three in number, all of the same fundamental nature, varying in closeness of vibration and in strength of tone. An appearance of threatening rage accompanied a series of loud somewhat nasal syllables: "oo, a, a, a, a, a, a," the opening note of lower pitch. This was a sort of whinney. At the opposite extreme was a soft closely-timed call, almost a trill, which to man conveyed an effect of contentment. The third note, vibrating but not in syllables, might be expressed as a groaning whine; this was very harsh and ascended in the scale after an opening syllable; it was only given at certain unhappy periods during which the Grebe went mad and tried persistently to escape, thrashing about and leaping up the side of box or tub. The first described note was often given when I could be heard in an adjoining room, and would fit in with an interpretation as a call for food, since it characterized early morning and ceased with feeding.

The frantic conduct that occurred at times was like that of several mature birds that I have put in a cage for short periods, but they would not learn complaisance. The Grebe reminded me of a captive Sparrow-hawk in its usual placidity, in its learning to know human beings as sources of food supply, and in its quiet glances about, that had the effect of engaging curiosity and enjoyment of attention.

The death of the Grebe after twenty-six days was sudden; shortly after being observed in perfect health it was found belly-up on the water, head and legs dangling down underneath.

Concord, N. H.

ADDITIONAL DATA ON THE BIRDS OF THE BOSTON PUBLIC GARDEN.

JOHN H. CONKEY.

MR. Gordon B. Wellman's article, "Further Records of the Birds of the Boston Public Garden from the Notes of Horace W. Wright,"[1] is of peculiar interest to many people in Boston and vicinity for it rounds out the published record of a complete quarter of a century of careful observation of this "isolated park area in the midst of the city." Mr. Wright's "Birds of the Boston Public Garden, A Study in Migration,"[2] recorded one hundred and twenty species of birds observed within the seventy-two acres comprising the Garden and Boston Common and Mr. Maurice Broun's "The Birds of the Boston Public Garden, 1921–1924,"[3] enumerated nine more; Mr. Wellman, with the twenty-seven additional species which he found mentioned in Mr. Wright's unpublished journal covering the years from 1909 to June 1920, has brought the total for the region to one hundred and fifty-six.

In view of the facts that the Garden and the Common attract a great many bird-lovers, all of whom are intensely proud of this splendid list of birds, and that the records since 1924 have been collected by the writer in another connection, it would appear not inadvisable to bring the interesting story down to the present day. Mr. Broun, to whom thanks are due for the use of his private records, continued to visit the Garden regularly until January, 1929 and to make complete notes on the birds observed there, and for the past two years the territory has been watched carefully by the writer and several other persons. During the years since the beginning of 1925, eleven species have been added to the list of the Garden avifauna, making a total of one hundred and sixty-seven to date, and five of the birds mentioned by Prof. Wellman as not having been seen between the years 1908 and 1925 have again been observed. These latter records are as follows:

---

[1] The Auk, Vol. XLVII, 1930, pp. 523–527.
[2] Boston and New York, 1909.
[3] South Braintree, 1925.

Glaucionetta clangula americana. AMERICAN GOLDEN-EYE.—Mr. Broun writes that he saw three drakes fly over the Garden on May 2, 1926.

Cryptoglaux acadica acadica. SAW-WHET OWL.—A bird was captured in the studio of an artist on Dartmouth Street on November 17, 1928, banded by Mrs. Alice B. Harrington, Secretary of the Northeastern Bird Banding Association, in the presence of Mr. Broun and the writer, and liberated on Boston Common. Another bird remained all day on April 29, 1929 in a small hawthorn in the Garden where it was seen by the writer and many other persons.

Dryobates villosus villosus. HAIRY WOODPECKER.—A female of this species was seen in the Garden at 2.30 o'clock on the afternoon of November 29, 1925 by Mr. Broun.

Protonotaria citrea. PROTHONOTARY WARBLER.—For three days, May 20, 21 and 22, 1927, a fine male sojourned in a tall Scotch elm near the corner of Boylston and Arlington Streets. It was first discovered by Mr. Broun and later seen by nearly all the bird-students who visit the Garden in spring.

Vermivora chrysoptera. GOLDEN-WINGED WARBLER.—Mr. Broun reports seeing a bird of this species on May 13 and 14, 1926, and again on May 23, 1927. The writer saw and heard a male on May 11, 1929 and is of the understanding that there are other records.

The list which follows is that of the eleven species added after January 1, 1925.

Phalocrocorax auritus auritus. DOUBLE-CRESTED CORMORANT.—In the early morning of May 3, 1929, the writer saw four birds flying southeast in characteristic formation. They passed low over the State House dome and across a corner of the Common, heading towards the harbor.

Anas rubripes rubripes. RED-LEGGED BLACK DUCK.—The following Garden records made by Mr. Broun seem to him to be of typical *rubripes:* one bird on November 13, 1926, October 15, and 18, 1927; two on October 12, 1927.

Aix sponsa. WOOD DUCK.—A drake of this species was seen several times in the autumn of 1927. Mr. Francis H. Allen first noted the bird on September 3, and Mr. George L. Perry and others observed it later in September and early October. It was last reported by Mr. Broun on October 14.

Erismatura jamaicensis. RUDDY DUCK. On May 28, 1931, a full plumaged drake spent the entire day in the pond and was observed by Messrs. Francis H. Allen, George L. Perry and others.

Gallinago delicata. WILSON'S SNIPE.—At about eight o'clock on the morning of April 24, 1926, Messrs. I. C. Tomlinson and Broun came upon a bird feeding in the grass near the bridge. It was as tame as the Robins which were all about it and permitted an approach of within fifteen feet. As Mr. Broun expresses it, the bird "was extracting worms faster than any of its companions." It remained for forty minutes.

Totanus flavipes. LESSER YELLOW-LEGS.—Mr. Broun and the writer, on August 21, 1928, were the fortunate observers of a bird of this species which circled low over the pond and gave its characteristic note.

Oxechus vociferus. KILLDEER.—On April 10, 1926, Messrs. Lawrence Kilham and Broun found a single bird feeding in the sediment at the Boylston Street end of the Pond-bed, the water having been drawn off previously, and on March 28, 1928 at ten minutes after one P.M. two individuals were seen by Dr. Francis Harper in the same locality.

Quiscalus quiscula quiscula. PURPLE GRACKLE.—Mr. Broun, who has had experience in New York in distinguishing birds of this species from their near relatives, Bronzed Grackles (*aeneus*), has identified three birds, one of which was also seen at very close range by the writer. The records follow: one bird on the Common on September 14 and October 3, 1927, and one bird in the Garden on September 24, 1927. Mr. Broun, who obtained his early training in bird-identification from Mr. Wright, says that that gentleman always had expectations of seeing typical *quiscula* in the Garden, but never realized them. According to Mr. William Brewster, occasional typical *quiscula* occur about Cambridge.[1]

Progne subis subis. PURPLE MARTIN. On the morning of May 18, 1931, Mr. George L. Perry saw a bird of this species flying over the pond.

Telmatodytes palustris palustris. LONG-BILLED MARSH WREN.—On the dull overcast morning of September 27, 1927, Mr. Broun found an individual of this species moving "pathetically" about in some low bushes near the middle entrance to the Garden from Charles Street.

Paroaria cucullata (Lath.). RED-CRESTED CARDINAL.—From June 2 to 25, 1926, this bird (undoubtedly an escaped cage-bird, although its plumage was in perfect condition) was seen daily on the Common in the vicinity of the Frog Pond. It was first noted by Mr. Arthur Parker and was observed and heard to sing on several occasions by scores of bird-lovers including the writer. Mr. Broun's description of its song, taken from a newspaper article is worthy of repetition. "It was a very delightful song," he writes, "as varied and jubilant as that of a Catbird singing earnestly, but more voluble and rich. Whenever it took flight from the ground, the cardinal uttered a short, low-pitched whistle that could not be compared with any of the notes of our native birds."

19 Myrtle St., Boston, Mass.

[1] The Birds of the Cambridge Region of Massachusetts. 1906, p. 248.

A GRAND ISLAND, NEW YORK, HERONRY.

BY ALBERT R. SHADLE.

(*Plate XVI.*)

IN September 1929, while taking a walk with Dr. John Handy and son, we came upon a heronry in a woods about a half mile from the "East River" channel of the Niagara River, north of North Tonawanda, N. Y. It was too late in the day to make a careful study of the nesting site, so after a very casual examination during which I counted fourteen carcasses of Great Blue Herons, we returned home, intending to visit the place later for a more careful examination. Unfortunately I was unable to visit it again that year.

Although this piece of woodland covers about twenty or twenty-five acres, the part occupied by the heronry includes probably less than one acre. The trees are largely oak, elm, soft maple, and ash and many of them are large enough for lumber.

On August 22, 1930, another trip was made to the woods for observations, and I found that the heronry seemed larger than it was in 1929. A systematic check showed one hundred eighty-four nests present, of which seventy-seven were thought to be Great Blue Heron nests and one hundred and seven smaller nests probably mostly those of the Black-crowned Night Heron. There was such an intergradation in size in nests, that these last two figures represent only an approximate division rather than an actual one. The number of trees containing nests was about fifty, and the number of nests per tree varied from one to thirteen. One big cottonwood contained ten Great Blue Heron nests, Fig. 1, a large elm had eight of the large nests and five small ones, another had seven large nests and three smaller ones, and two red maple trees held respectively eight and seven small nests. The oaks and red maples generally contained the smaller nests, Fig. 2, while most of the larger nests were in the elms and cottonwood.

Judging from the condition of the foliage under these nests, all of them seemed to have been used this year. Under many of the groups of nests much of the weedy vegetation was killed, apparently by the excrement. However, the only one of the trees which

showed the killing effects of excrement was a large cottonwood. Since the killing of the trees is one of the results of the presence of numbers of such birds over a period of time it may indicate that this is a heronry of only a few years standing.

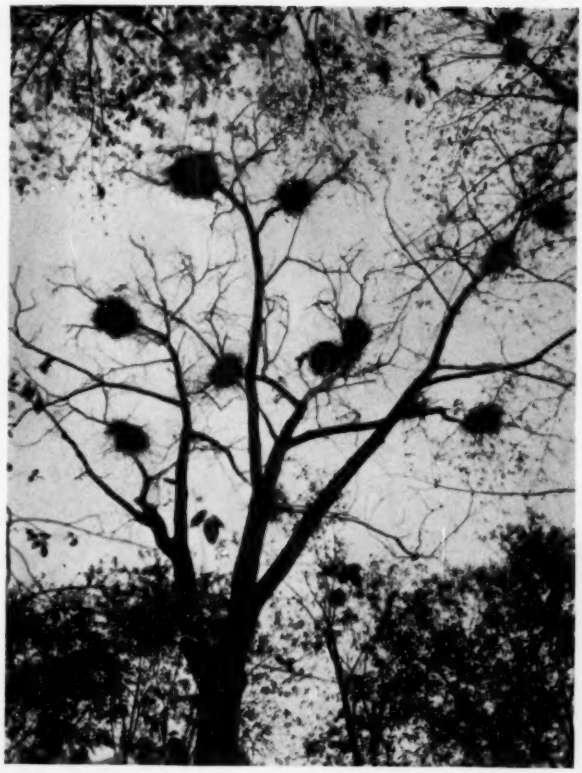
THE DISTRIBUTION OF NESTS.

No. nests in group	*Small nests*		*Large nests*	
	No. groups	*No. nests*	*No. groups*	*No. nests*
1	17	17	5	5
2	16	32	3	6
3	8	24	2	6
4	2	8	1	4
5	1	5	2	10
6	1	6	1	6
7	1	7	2	14
8	1	8	2	16
9	0	0	0	0
10	0	0	1	10
Total		107		77
Total number nests			184	

A very disastrous raid had been made in the heronry this summer apparently during the months of June and July, and the young when killed were in many cases nearly ready to leave the nest and the condition of the bodies when found suggested that they had been dead for a month or two. The killing had evidently been done with a .22 rifle for three discarded cartridge boxes were found on the site. A check of the dead birds was made and the heads collected with the following results:

Black-crowned Night Heron (*Nyctocorax nycticorax naevius*).....20
Great Blue Heron (*Ardea herodias herodias*).....66
Total dead birds.....86

Five Great Blue Herons were found still lying on the nests where they had been killed and one had lodged about twelve feet from the ground in a sapling, and was hanging by its neck. Fourteen birds, twelve Great Blue Herons and two young Black-crowned Night Herons were lying under one large elm which contained thirteen nests. Other numbers of dead were lying about in groups of from two to seven. Doubtless not all of the birds were found for it was



NESTS OF GREAT BLUE AND BLACK-CROWNED NIGHT HERONS, NORTH TONAWANDA, N. Y.

difficult to discover them when they got any distance away from the nests. The condition of the bodies showed that the killing had been done at different times.

As to a motive for the destruction and identity of the killer there is little or no evidence. The person was evidently not a good marksman for only two of the heads had been struck by a bullet. They were not killed for any part of the birds for nothing had been disturbed from the time the birds were shot and they were lying just as they had fallen out of the trees.

The way in which the birds were shot, the large number of cartridges used and the number killed, suggest that it was the work of a boy with a rifle or that of an extremely ignorant and malicious man. No man with the slightest suggestion of sportsmanship in him would have perpetrated such an act unless he thought he was thereby protecting the fish of the region.

The Herons of the state were formerly much more abundant than they are at present for they have been destroyed in considerable numbers. The Great Blue Heron is not protected by state law, and Herons in general are shot on sight because they take some of the fish. Man forgets that before he began his wasteful methods of taking fish, and his pernicious habit of poisoning the waters of the lakes and rivers with his wastes from cities and factories, that there were plenty of fish for both the Herons and man.

If the raiding continues it will soon result in the extermination of this heronry which is the largest one in this part of the state. The next largest one in this region is found in the Tonawanda swamps and it has about one hundred nests, as compared to one hundred eighty-four nests in the Grand Island Heronry. An effort will be made to protect it from future raids.

University of Buffalo, Buffalo, New York.

A NEW HONEY CREEPER FROM THE AMAZON.

BY ERNEST G. HOLT.

WHEN the National Geographic Society Brazilian-Venezuelan Expedition was proceeding last year up the Amazon to its rendezvous at Manáos with the boundary commissions of Brazil and Venezuela, our steamer stopped for fuel early one morning at a wood station on the north bank. Advantage was taken of this break in the voyage to collect a few birds, and when the bag was examined, two of the specimens could not be identified. Reëxamination of these birds in the laboratory in comparison with congeneric material shows them to represent a species new to science—a remarkable fact when it is considered that this stretch of the Amazon has been for generations the highway of naturalists and commercial collectors. Because a complete report on the Expedition's extensive collections must be indefinitely deferred, this interesting find is here described as

Ateleodacnis margaritæ, sp. nov.

Type.—No. 326560, U. S. National Museum, adult male with active gonads; north bank of Rio Amazonas at Ceo do Arary above Parintins, Estado do Amazonas, Brazil, September 20, 1930; Collectors' No. 3703, Holt, Blake, and Agostini.

Characters.—Closely allied to *Ateleodacnis bicolor* (Vieillot) and similar to it in size and in the absence of color pattern or markings, but differs from *bicolor* in the lighter, clearer, blue-gray of the upper parts, and in the pale bluish gray instead of brownish buff underparts.

Description of the type.—Upper parts uniform blue-gray, approximately between clear green-blue gray, and deep green-blue gray (of Ridgway's "Color Standards and Color Nomenclature," 1912); remiges blackish, margined externally with the color of the back, internally with whitish; under parts near light gull gray (though a trifle more bluish perhaps) becoming almost pure white on middle of belly and under tail coverts; upper surface of tail like back, under surface dusky grayish; bill dark horn color, lighter along the commissure; tarsi and feet reddish (in the dried specimen).

Measurements of the type.—Wing, 63; tail, 44; tarsus, 17; middle toe without claw, 11; exposed culmen, 11 mm.

Remarks.—Despite its general similarity to *bicolor*, *margaritæ* must be considered specifically distinct. Not only is the degree of difference considerable, but *margaritæ* was taken near the geograph-

ical center of the range of *bicolor*, and *bicolor*, though ranging from Colombia and French Guiana to southeastern Brazil, has not been shown to be subspecifically divisible.

The second specimen of *margaritæ* was not definitely sexed, but is apparently also a male, though somewhat immature. Nevertheless, except for slightly smaller dimensions, it is practically identical with the type.

This exquisite but modest bird is dedicated as a very paltry though peculiarly fitting tribute to one who, steadfastly refusing all credit, has long borne the full brunt of my ornithological activities—Margaret Lander Holt, my wife.

For laboratory facilities and other courtesies I gratefully acknowledge my indebtedness to Dr. Herbert Friedmann and Mr. J. H. Riley of the Division of Birds, U. S. National Museum.

312 Bell Building,
Montgomery, Alabama.

BIRD WEIGHTS OF 52 SPECIES OF BIRDS (TAKEN FROM NOTES OF WM. VAN GORDER).

BY SIDNEY R. ESTEN.

WILLIAM B. VAN GORDER was born in Noble County, Indiana, February 3, 1855. He was interested in botany and ornithology, and wrote several noteworthy articles on each subject. He resided in Noble County until 1895 when he became Superintendent of Schools at Knightstown, Indiana and at Worthington in 1898. In 1915 he returned as Superintendent of Schools at Albion Noble County where he remained until his death April 7, 1927.

He kept migration records, studying the habits of birds and banding them. After his death his bird records of some forty years were sent me by his daughter who desired that they be utilized to the best advantage.

One of the many phases of Mr. Van Gorder's bird study was the taking of bird weights, and the following is the result of his work in this line:

Gavia immer. LOON.—March 31, 1911, ♂, 3,629 grams. April 25, 1915, ♀, 3,260 grams.

Larus argentatus smithsonianus. AMERICAN HERRING GULL.—Nov. 12, 1911, 1,184 grams. March 14, 1912, 1,021 grams.

Hydrochelidon nigra surinamensis. BLACK TERN.—May 8, 1915, two, 60 and 60.3 grams.

Anas platyrhynchos. MALLARD.—Nov. 14, 1917, ♂, 1,077 grams. Oct. 31, 1913, ♀, 964 grams.

Mareca americana. BALDPATE OR WIDGEON.—March 14, 1911, ♀, 709 grams.

Nettion carolinense. GREEN-WINGED TEAL.—Oct. 31, 1913, ♂, 272 grams.

Querquedula discors. BLUE-WINGED TEAL.—April 4, 1911, ♂, 361 grams. April 4, 1911, ♀, 305 grams.

Spatula clypeata. SHOVELLER.—March 14, 1911, ♂♂, 567 and 539 grams, ♀, 453 grams. April 8, 1912, ♀, 510 grams. April 4, 1911, ♂, 595.5 grams.

Aix sponsa. WOOD DUCK.—March 16, 1911, ♂♂, 737 and 624 grams.

Marila americana. RED-HEAD.—March 14, 1911, ♀, 992 grams.

Marila marila. AMERICAN SCAUP DUCK.—March 14, 1911, 737 grams.

Botaurus lentiginosus. AMERICAN BITTERN.—April 7, 1914, 878 grams (in good condition). 316 grams (only half grown). 660 grams (very

poor condition). Nov. 23, 1911, 715 grams. Nov. 14, 1913, 467.5 grams (very poor condition).

Ardea herodias herodias. GREAT BLUE HERON.—Oct. 21, 1914, 3,062 grams. Sept. 20, 1914, 2,551.5 grams.

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.—Sept. 22, 1914, 933 grams.

Rallus virginianus. VIRGINIA RAIL.—May 3, 1911, three, 88.2, 75.2, and 71 grams.

Porzana carolina. SORA RAIL.—April 24, 1911, two, 76 and 106 grams. April 9, 1915, 51 grams (very poor). May 3, 1911, two, 61.5 and 83.5 grams. April 27, 1916, two, 125.7 and 111.7 grams.

Fulica americana. COOT.—April 27, 1916, three, 496, 551, and 550.2 grams.

Gallinago delicata. WILSON'S SNIPE.—April 24, 1911, six, 107, 111, 105, 118, 131, and 129 grams. May 3, 1911, 132 grams.

Pisobia maculata. PECTORAL SANDPIPER.—twenty-two, 92, 110, 90, 99, 104, 108.5, 97, 102, 95, 85, 71.4, 68.2, 67.1, 73.5, 110, 89.1, 81, 85, 85.5, 83.8, 71, 82 grams.

One kept alive weighed the first day after arrival 82 grams while six days later it weighed 106 grams.

Totanus flavipes. LESSER YELLOW LEGS.—April 24, 1911, 98 grams. March 18, 1911, 104 grams.

Colinus virginianus virginianus. QUAIL.—Nov. 12, 1914, ♂ ♂, 172 and 170 grams. Nov. 14, 1914, ♂, 187 grams. Dec. 20, 1914, seven males, 170, 167.8, 162, 135 (very poor), 170, 127 (very poor), and 148 grams (very poor). Dec. 28, 1914, four males, 184.6, 148.6, 196.4, and 171.6 grams. Nov. 17, 1914, six males, 169.5, 165, 185, 173, 173 and 178 grams.

Buteo borealis borealis. RED-TAILED HAWK.—Nov. 3, 1911, 1,083 grams (young). Dec. 25, 1911, 1,308 grams (adult). Oct. 24, 1912, 1,226 grams (adult).

Archibuteo lagopus sancti-johannis. ROUGH-LEGGED HAWK.—March 8, 1912, 1,027 grams. Jan. 7, 1913, 915 grams. April 4, 1913, 723 grams.

Haliaeetus leucocephalus leucocephalus. BALD EAGLE.—Jan. 6, 1916, 4,880 grams.

Falco sparverius sparverius. SPARROW HAWK.—Dec. 10, 1911, ♂, 112.4 grams. Nov. 18, 1911, ♀, 103.4 grams. Nov. 28, 1912, ♂, 102 grams. Dec. 27, 1915, ♀, 132.6 grams.

Aluco pratincola. BARN OWL.—Sept. 17, 1911, 321 grams (poor).

Asio flammeus. SHORT-EARED OWL.—Jan. 3, 1911, 326 grams. Jan. 4, 1911, 339 grams. Jan. 6, 1911, 394 grams. Feb. 4, 1913, 339 grams. Dec. 13, 1913, 320 grams.

Otus asio asio. SCREECH OWL.—Jan. 8, 1912, 139 grams. Jan. 12, 1912, 114 grams (starved). Nov. 1, 1915, 162.6 grams. Jan. 4, 1916, 157 grams. Jan. 2, 1924, 122.6 grams (starved).

Sphyrapicus varius varius. YELLOW BELLY SAPSUCKER.—April 5, 1915, 51 grams.

Chordeiles virginianus virginianus. NIGHT HAWK.—Sept. 1, 1922, 60 grams. Sept. 10, 1915, 106.2 grams.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.—Sept. 28, 1917, 53 grains (3½ grams). May 17, 1921, 54 grains (3½ grams).

Sayornis phoebe (Lath.). PHOEBE.—April 13, 1916, two, 19.3 and 19.7 grams.

Cyanocitta cristata cristata. BLUE-JAY.—Feb. 23, 1914, 74.4 grams.

Corvus brachyrhynchos brachyrhynchos. CROW.—Dec. 10, 1915, 508 grams. March 18, 1916, 415 grams (poor). Feb. 24, 1916, two, 497 and 495 grams.

Sturnella magna magna. MEADOW LARK.—Dec. 18, 1914, 104 grams.

Icterus spurius. ORCHARD ORIOLE.—June 26, 1914, ♂, 22.7 grams.

Passer domesticus. ENGLISH SPARROW.—March 15, 1915, ♂♂♂, 27.2, 27 and 30 grams, ♀♀ 26.3 and 27.5 grams.

Spizella monticola monticola. TREE SPARROW.—Feb. 5, 1916, 17.6 grams.

Spizella pusilla pusilla. FIELD SPARROW.—April 13, 1916, two, 12 and 11.8 grams. April 17, 1916, 12 grams. Oct. 17, 1917, 13.75 grams.

Junco hyemalis hyemalis. SLATE-COLORED JUNCO.—Feb. 5, 1916, 20.2 grams. Oct. 24, 1923, 20 grams.

Passerella iliaca iliaca. FOX SPARROW.—Oct. 17, 1917, 33.6 grams.

Richmondena cardinalis cardinalis. CARDINAL.—Jan. 2, 1914, ♂, 41 grams. April 13, 1916, ♂, 40 grams.

Lanius ludovicianus ludovicianus. SHRIKE.—April 13, 1916, 51.8 grams.

Dendroica coronata. MYRTLE WARBLER.—Oct. 21, 1915, 10.9 grams.

Dendroica virens. BLACK-THROATED GREEN WARBLER.—Oct. 16, 1913, 9.5 grams.

Seiurus aurocapillus. OVEN-BIRD.—May 17, 1921, 19.5 grams.

Mimus polyglottos polyglottos. MOCKINGBIRD.—April 20, 1915, 50.8 grams.

Certhia familiaris americana. BROWN CREEPER.—April 22, 1908, 117 grains (7.6 grams).

Penthestes carolinensis carolinensis. CAROLINA CHICKADEE.—April 13, 1916, 9 grams.

Hylocichla mustelina. WOOD THRUSH.—Sept. 24, 1912, 50.6 grams.

Planesticus migratorius migratorius. ROBIN.—April 15, 1915, 81 grams.

4112 Graceland Ave.,
Indianapolis, Indiana.

AN ACCOUNT OF THE YELLOW-GREEN VIREO (*VIREOSYLVA FLAVOVIRIDIS* CASSIN)

BY JAMES L. PETERS

THE Yellow-green Vireo enjoys a place in the Check-list of the American Ornithologists' Union on the basis of three instances of accidental occurrence within the limits covered by the Check-list.

To the bulk of ornithologists and bird-students in this country this bird is a name only, and for that reason an account of its history, range, geographic variation, migrations, etc. may prove of some interest.

This study is based on the series of sixty-five skins of the species in the Museum of Comparative Zoology, supplemented by over fifty from the main collection and fifty-three from the Dwight Collection of the American Museum of Natural History. In addition I have examined single birds or small series from the collections of the Biological Survey, Academy of Natural Sciences of Philadelphia and Mr. Donald R. Dickey.

It is now generally conceded that the Yellow-green Vireo is divisible into three subspecies as follows: *Vireo flavoviridis flavoviridis* (Cassin), *Vireo flavoviridis forreri* Madarász, and *Vireo flavoviridis insulanus* Bangs.

The species belongs to that group of more or less closely related Vireos including *Vireo magister* and subspecies, from the islands off the coast of Yucatan and in the Gulf of Honduras; *V. caymanensis* from the island of Grand Cayman; *V. olivaceus* and subspecies (Black-whiskered Vireo) of the West Indies, *Vireo olivaceus*[1] (Red-eyed Vireo) from North America, and *Vireo chivi*[2] and subspecies from South America. Of this group it is most nearly related to *Vireo olivaceus*, apparently representing it in Mexico and Central America as does *Vireo calidris*[1] in the West Indies, but the differences separating the three groups are certainly of more than subspecific value.

---

[1] While these are the names adopted in the A. O. U. Check-list the author considers that *olivaceus* Linn. is based on the West Indies bird and replaces *calidris* which would require the use of *virescens* Vieillot for the Red-eyed Vireo.

[2] Mr. Todd's paper (Auk, July 1931) appeared long after the present paper was submitted.—Ed.

Vireo flavoviridis (CASSIN)

Description.—Pileum and hind neck mouse gray or neutral gray the anterior part with a dusky border, more or less distinct; superciliary stripe grayish-white; rest of upper parts and tail olive green; wings dusky, the feathers margined with yellowish olive; lores grayish-white like the superciliary, becoming dusky in front of the eye. Below white, flanks and sides of neck and chest olive yellow, becoming lemon yellow on the under tail coverts; under wing coverts pale lemon yellow or sulphur yellow. Bill, legs and feet bluish gray or grayish blue in life; iris "red." Wing (males) 74.5–86.5; females 71–78.5.

Breeding Range.—Mexico from Sonora and Tamaulipas south to the Canal Zone and the Pearl Islands but absent from the Caribbean coast of Central America south of Guatemala; Tres Marias Islands.

Vireo flavoviridis flavoviridis (CASSIN)

Vireosylva flavoviridis Cassin, Proc. Ac. Nat. Sci. Phila., **5**, 1851, p. 152, pl. 11 (Panama and Nicaragua).

Subspecific Characters.—Superciliary stripe distinct, dusky border of pileum usually well defined; size medium. Wing (males) 77–83; average of 39 breeding birds 78.2 mm.; females 73–80, average of 14 breeding birds 76.5.

Range.—Mexico from Sonora, Nuevo Leon and Tamaulipas south on the Pacific coast to northwestern Costa Rica and on the Caribbean slope to eastern Guatemala. Apparently absent from the Caribbean rain forest from Honduras southward except that summer birds from eastern Costa Rica (Carillo, 1500 feet and Mojon, 3500 feet) are referable to this form. Winters in upper Amazonia. Accidental at Godbout, Quebec (Merriam, 1883), Brownsville, Texas (Merrill, 1878, p. 125) and Riverside, California (Price, 1888).

Cassin based his original description on four specimens in the Academy of Natural Sciences, of Philadelphia but these cotypes no longer exist (Stone, 1899, p. 31). His description applies equally to *f. flavoviridis* or *f. insulanus*, but the wing measurement of 3.2 inches is equivalent to 81.5 mm. and can apply only to the form breeding in Mexico and northern Central America.

Most persons who have studied the birds of Central America in recent years are now convinced that the Yellow-green Vireo is migratory, but practically nothing has been published concerning the dates of migration or the winter home of the species. Cherrie (1890, p. 329) appears to have been the first to recognize the fact that the bird is not a permanent resident in Costa Rica, stating that it disappeared from the neighborhood of San José with the

beginning of the dry season at the end of September and reappeared again in April. Also as far back as 1881 Salvin and Godman (1881, p. 190) suggested that the birds taken in winter in South America were there only at that season, this observation being prompted by a specimen taken at Yquitos, Peru by Whitely on 16 October, 1878, together with the lack of records of its occurrence in Mexico and Central America outside of the period from April to August inclusive.

That the winter home of the species is in Amazonian Colombia, Ecuador, Peru and Bolivia, is, I think well established. Early references in literature of its occurrence in South America for the most part fail to give the dates when the specimens were secured. The first published instance of its occurrence in Amazonia was by Taczanowski (1874, p. 509) who records a specimen collected at Monterico, Peru by Jelski; the same author (1882, p. 7) lists an example taken by Stolzmann 23 February 1881 at Yurimaguas, Peru. Gadow (1883. p. 295) lists skins in the British Museum collection taken at Guayango, Peru; Rio Napo, Ecuador; and "Bolivia." Todd (1922, p. 434) in detailing the records of *V. flavoviridis* from the Santa Marta region, shows that all the dates of occurrence there are between 12 August and 20 October, when the birds are common throughout the lowlands below 1000 feet, especially in that part of the region lying westward of the mountains. The fact that there are no winter or spring records may indicate that the bird passes further south and possibly returns northward by another route.

Chapman (1917, p. 539) gives only two records from Colombia, both from Chicoral in the Magdalena Valley, 23 August and 13 October. For Ecuador Chapman (1926, p. 586) records *Vireo flavoviridis* from San Jose 11 March–11 April and from Rio Suno, 7 and 8 March; both localities situated on affluents of the Rio Napo. Besides this published evidence I have examined specimens in the American Museum of Natural History and the Museum of Comparative Zoology as follows:—Eastern Ecuador, Rio Curaray and Lagarto Cocha 8, 10 November and 18 January. Southeastern Peru: 15, 22 October; 10, 13 December; 2 February. Bolivia: 23 February, 5 March. Ménégaux (1911, p. A 70) records a specimen of *Vireo flavoviridis* from Santo Domingo, Ecuador, a locality

in the humid tropical zone of the Pacific slope. I have doubts however as to the correctness of the identification, the bird is given as a ♂ with a wing of only 68 mm. and a bill of 12 mm., the wing is much too small even for *V. f. insulanus*, but corresponds with the smaller birds of the *Vireo chivi* group.

At this point it is important to remember that there is not a single record for any form of *Vireo flavoviridis* in Mexico or Central America between 7 October and 14 February.

Northward Migration.—As will be shown later, *V. f. insulanus* arrives in the Canal Zone ahead of *V. f. flavoviridis* so the dates of arrival of one race or the other must rest upon actual specimens. *V. f. flavoviridis* puts in its appearance in Panama at the end of February or the first week in March. February arrivals are most unusual, the only certain date being for a male taken in Chiriqui, 4800 feet, 26 February, 1901 by W. W. Brown; the same collector also secured two females at the same place 3 and 4 March 1901; a specimen in the Biological Survey collection was shot at Tabernilla, Canal Zone, by E. A. Goldman, 12 March 1911. In 1904 when Brown was collecting on Saboga Island, one of the Pearl Islands, he shot six males and two females between 2 and 12 April, all referable to *f. flavoviridis* and did not get the resident *insulanus* at all. Evidently the spring migration was then at its height.

In the vicinity of San José, Costa Rica, Cherrie says that the bird has returned to its usual haunts by the tenth of April. On the Pacific slope of Nicaragua the earliest date is 9 April, a specimen taken by Miller and Griscom in 1917.

The earliest date for anywhere in Central America north of Panama is that of a specimen collected at Mazatenango, western Guatemala by Ned Dearborn between 15 and 21 March, 1906 (Dearborn, 1907, p. 124); A. W. Anthony shot two males at La Perla, eastern Guatemala 1 and 2 April 1927. On 28 March 1912, I killed a singing ♂ at Camp Mengel, Quintana Roo. Cole (1906, p. 136) took a male at Chichen Itza, Yucatan 3 April 1904. From Vera Cruz there is a male in the M. C. Z. taken at Presidio 6 April 1925, by W. W. Brown and from Oaxaca, a male taken by the same collector 15 April 1927. As is to be expected the first arrival in every case was a male. On the other hand, a belated migrant from Darien, a female, was taken on Mt. Sapo at Cana, 26 April 1928 by R. R. Benson.

Song.—The song of the Yellow-green Vireo is practically indistinguishable from that of the Red-eye. In Central America the birds usually frequent tall trees in the river valleys, but are never found in the rain forest regions, except when it seems to be one of the species that works in if the forest is cleared away.

Nesting.—Very little is known about the breeding habits of this bird or either of its subspecies, beyond Cherrie's (1890, p. 329–331) account. He first noted birds near San José, Costa Rica, carrying nesting material 24 April 1889, and discovered a nest with 2 fresh eggs 12 May; a second nest containing three fresh eggs was taken 21 May and a third nest with three heavily incubated eggs 26 May. These nests were all suspended between small twigs hanging either above a stream or low ground at a height of from four to ten feet, and were composed of a lining of very fine dry grass, the outside covered with soft dry leaves, and shreds of papery bark all bound in place with spider webs. The eggs are described by Cherrie as being "white, speckled chiefly at the larger end with spots varying in color from a dark chestnut to an orange rufous, the chestnut predominating." They measured as follows (dimensions in inches and hundredths): .81 x .57, .81 x .58, .76 x .58, .75 x .57, .79 x .60, .83 x .56, .84 x .55 and .84 x .56.

The first fledgling was secured 30 June and by 20 July family parties were noted. Carriker (1910, p. 784) describes a nest and three fresh eggs taken 8 June 1907 at Punta Arenas, Costa Rica, as follows. "The nest was a beautiful structure, very compact, and well made of weed-fibres and bark, covered over on the outside with golden and white spider-webs and spider egg-cases, and lined with fine, round pale brown fibres exactly after the manner of the Warbling Vireo. The eggs are white, speckled and dotted sparingly over the whole surface with deep burnt-umber. The nest was suspended from a horizonal fork among the foliage of a fruit-tree of some tropical variety, about fifteen feet from the ground, and not more than a hundred feet from a house on the outskirts of the town."

In the M. C. Z. there is a set of four eggs collected 12 May 1926 by A. W. Anthony at the Finca Carolina, 10 miles south of Tumbador, Guatemala; one of the eggs is broken, the other three measure 21.5 x 15; 21.0 x 15; 21.5 x 15 mm. respectively. The collector's

notes describe the nest as "typical vireo, in coffee tree six feet from the ground." There is in the Dwight collection (no. 61037) a fully fledged juvenal moulting into immature plumage collected at Finca Cipres, western Guatemala, 28 June, 1925.

Southward Migration.—Lawrence (1874, p. 272) quoting Grayson (Ms.) writes "none are seen after August [at Mazatlan] migrating probably to Central America after breeding." In the large series taken by A. W. Anthony in western Guatemala during the years 1924–1927 are five birds from the Hacienda Carolina, taken as follows: 1 ?, 27 September, 1927; 1 ♂, 29 September 1927; 1 ♀, 30 September 1927; 1 ♂, 1 October 1927; 1 ♀, 6 October 1925. In this connection it is interesting to note that the Riverside California specimen was shot 29 September. Cherrie (1890 A, p. 331) writes that the resident birds had disappeared from the vicinity of San José by August 20th, though during the night of 28 September 1889 a number of Yellow-green Vireos were among other species killed by flying against wires in the city of San Jose. At the time a considerable southward movement of many species of North American migrants was in progress. There is the skin of a male in the Museum of Comparative Zoology collection taken at San Jose, 7 October 1902 by C. F. Underwood. The only fall dates at present available from Panama are: 27 September 1927, a ♂, Changuinola; a ♀ from Perme, eastern Panama, 3 September 1929 both taken by H. Wedel.

Moults and Plumages.—JUVENILE.—No specimens in fresh juvenile plumage seen, but judging from partly moulted juvenals the bird has a plumage like that of *V. olivaceus*, but the lateral underparts with a much more extensive and deeper yellowish wash.

IMMATURE.—Acquired by a complete post-juvenile moult involving all tracts except the primaries, secondaries, greater wing coverts and tail. In Guatemala this plumage is complete by the beginning of the third week in August.

ADULT WINTER.—Not distinguishable from immature plumage; acquired by a complete post-nuptial moult beginning about the middle of July and complete before the first of September.

NUPTIAL.—The number of wintering specimens available is not sufficient to determine with any exactness how extensive the

prenuptial moult is. I have examined specimens in the American Museum taken in western Amazonia between 2 February and 3 April which were undergoing a moult of the primaries. A prenuptial moult of the primaries is an exception among oscine birds. Dwight (1900, p. 235–240) makes no mention of it at all, nor does Stone (1896, p. 156–157), where these authors discuss the plumages of the Vireos found in north-eastern North America.

Vireo flavoviridis forreri MADARÁSZ

Vireo forreri Madarász, Termes. Fuzetek, **9**, pt. 1, 1885, p. 85, pl. 6 (Tres Marias Islands).

Subspecific Characters.—Superciliary stripe indistinct, dusky border of the pileum only indicated; size large, wing ♂, 82–86.5 (83.6).

Range.—Probably only a summer resident on the Tres Marias Islands off the west coast of Mexico. If migratory, dates of migration and winter home are unknown.

Salvin and Godman (1881, p. 189) first recorded this Vireo from the Tres Marias Islands under the name of *Vireo flavoviridis*. They had but a single specimen, a bird sent them by Alfonse Forrer, which he shot 4 May 1881. Salvin and Godman noted the characters, but did not deem them of sufficient importance in only one example to recognize by name. Forrer also sent a specimen collected 5 April 1881 to the Hungarian National Museum. Madarász did not entertain the doubts that Salvin and Godman held, but named the bird as above.

All that is known to date of the life history of Forrer's Vireo was gleaned by Nelson and Goldman on their visit to the Tres Marias Islands between 2 and 31 May 1897. Nelson writes as follows (1899, p. 54):

"It is very common in the small trees in the patio of the custom house and elsewhere about the settlement on Maria Madre. Like its mainland relative, its habits are very similar to those of the Red-eyed Vireo. Its favorite range was in the smaller growth of forest along the lower slopes from near the sea up to an altitude of 600 or 700 feet, but some were seen up near the summits of Maria Madre and Maria Magdalena. Next to the Tres Marias Warbler, Forrer's Vireo was probably the most abundant bird on Maria Madre, and its restless habits while fluttering and peering about in search of food among the small tree tops added greatly to the animation of the forest."

Nelson (op. cit.) expresses astonishment at the fact that Grayson did not obtain this bird on any of his three voyages to the Tres Marias Islands. Thinking that perhaps Grayson did not visit the islands during the spring and summer months I asked Dr. Joseph Grinnell if he could supply me with the actual dates of Grayson's three voyages. This Dr. Grinnell has most kindly done, after consulting the Grayson manuscripts in the Bancroft Library at the University of California. The manuscripts give explicit dates for specimens of various birds taken on the islands as follows: 1865, January, March, March 10 and April. 1867, April, May, June 1. No dates were found for the voyage supposed to have been made in 1866. Dr. Grinnell has also discovered that Grayson had trained a boy to collect for him, and suggests the possibility that Grayson might have sent the boy on short trips to the islands when he did not go there himself.

There is as yet no direct evidence that Forrer's Vireo is really migratory, on the other hand there is no special reason for considering that an insular form close to the northern limit of the range of the species is sedentary. More weight could be attached to Grayson's failure to secure the bird in January, February and March if he had succeeded in securing it in April, May and June. Perhaps the inclusive dates of Forrer's visit, if obtainable, might shed some light on the subject.

A specimen of *V. flavoviridis* in the American Museum collected 9 April in western Nicaragua has a wing of 84.5 which is 1.5 mm. larger than the maximum for *V. f. flavoviridis*, and while on basis of size might be referred to *forreri*, it is perhaps better to consider as the extreme of *f. flavoviridis*.

Vireo flavoviridis insulanus BANGS

Vireo insulanus Bangs, Proc. N. E. Zool. Cl., **3**, 1902, p. 73 (San Miguel Island, Pearl Islands).

Subspecific Characters.—Superciliary usually distinct, but dusky border of pileum generally obsolete; size smaller, wing, ♂ 74–79, average 21 ♂, 76; ♀ 71–77.5, average 13 ♀, 74.25.

Range.—Térraba Valley in southwestern Costa Rica, Canal Zone (chiefly Pacific side) and probably other suitable localities on the Pacific coast of Panama; Pearl Islands (recorded definitely only from San Miguel Island). Probably migratory, but winter home unknown.

This form was originally recorded by Bangs (1901, p. 30) from San Miguel Island as *Vireo chivi agilis* (Licht.) but was separated by him as a distinct species the following year. Its specific status remained unquestioned until Rendahl (1920, p. 43–45) reduced it to subspecific rank. Up to now however no one seems to have recognized the fact that it is this race and not true *flavoviridis* that breeds in south-western Costa Rica and in the Canal Zone.

A female in worn plumage was secured by Barbour, Brooks and Underwood on Mt. Sapo, Darien, 25 April 1922, recorded by Bangs and Barbour (1922, p. 223) as *f. flavoviridis.* With a wing of 74 mm. combined with its abraded plumage and entire absence of a dusky border to the pileum, identification as *insulanus* is certain. The differences between this bird and a specimen (M. C. Z. 140896) taken at Cana, eastern Panama, 26 April 1928, are very noticeable; the latter sexed as a female by its collector, Benson, and marked as having the ovaries not enlarged, is in fresh plumage with a dusky border to the pileum and has a wing of 80 mm.

The probabilities are that Barbour, Brooks and Underwood collected their bird in some extensive clearing on the lower slopes of the mountain; I much doubt whether the bird occurs in the heavy rain forest of that region.

Unfortunately in none of the localities where *insulanus* occurs as a breeding bird has any collecting been done the "year around" by any one man. Rather the efforts of many have been concentrated during the period of February to April inclusive, though Goldman worked practically continuously in the Canal Zone from the end of December 1910 until July 1911 and Hallinan made his collections intermittently over a period of years. It is significant nevertheless that none of the collectors in the Canal Zone have met with the bird there before the middle of February, but numerous instances of occurrence exist from then on until May. The Costa Rican range of *V. f. insulanus* has been worked in April, May and June where the bird was present throughout that period. Thus while the date of departure is not known and the bird's winter range equally unknown the dates of spring arrival can be given, as well as a limited amount of information on the subject of breeding.

Northward Migration.—V. f. insulanus arrives on its breeding

ground in the Canal Zone and the Pearl Islands, and probably also southwestern Costa Rica, ahead of the main flight of *V. f. flavoviridis*. Actual dates based on specimens are as follows: Canal Zone: Empire, 1 ♂, 14 February 1912, E. A. Goldman. Hallinan (1924, p. 324) records (as *V. f. flavoviridis*) a ♂, 21 February 1916 from Juan Mina, C. Z. This specimen, now in the American Museum, has been examined in this connection; it proves to be *insulanus*. Pearl Islands: San Miguel Island, 1 ♂, 1 ♀, 16, 17 February 1926, L. Griscom, specimens in American Museum; 2 ♂, 23 February 1904, W. W. Brown. Goldman secured a ♀ at Tabernilla, C. Z. 10 March 1911 and Brown took additional specimens on San Miguel Id. 3–17 March. Mr. Griscom has generously supplied me with the dates on which he has seen Yellow-green Vireos in Panama. Since observations are not supported by specimens, it is by no means certain whether *insulanus* was the bird in every case, though it is probable that the bulk of them are. February 1924: 14, Ancon; 15, Old Panama; 17 Taboga Id., 21, Santiago de Veraguas "common"; 25, Tole, "common"; 27, Remedios "common." February 1926: 15, Ancon.

V. f. insulanus has never previously been attributed to the Canal Zone, but has been recorded as *flavoviridis* on several occasions. I have been able to examine the two birds recorded by Hallinan (1924, p. 324) and find them to be *insulanus* as is likewise the specimen collected by Jewel at Agua Clara, 19 May 1912 (Stone, 1918, p. 273). Unrecorded examples definitely referable to this subspecies, were secured by Goldman in the Canal Zone as follows: Tabernilla, 18, 20, 29 April 1911; Gatun, 22 April 1911; Frijoles, 9 May, 1911; Miraflores, 13 May 1911.

Nesting.—There is practically no information available regarding the nest dates or eggs of this subspecies. The plumage of Pearl Island birds collected in late April is much more abraded than that of examples of *f. flavoviridis* taken in Mexico and northern Central America at the corresponding season, indicating that breeding on the islands at least commences a couple of weeks or more earlier than on the mainland. Underwood took fledglings in the Térraba Valley, Costa Rica, 23 June 1908 and 25 June 1906.

Southward Migration.—No data available because of lack of field work in the breeding range of the subspecies after 1 July.

Moults and Plumages.—Probably not different from those of *V. f. flavoviridis.* A bird collected 23 June, 1908 has the immature plumage partly complete, but with some juvenile feathers on the head, scapulars, interscapulars and throat, the yellow flank feathers not fully grown out. Another example from Barranca, Boruca shot 25 June 1906 has the immature plumage fully developed except for scattered traces of the juvenile on back and nape.

An adult (sex not determined) collected by C. F. Underwood at Paso Real, Boruca, 14 July 1906 has nearly completed the moult, part of the body plumage is fresh with many pin feathers scattered through; the primaries have been renewed, but the two outermost are not fully grown out; the tail has also been renewed but only the two middle pair are fully grown out, the outer pair is but a little more than half as long as the middle ones.

LITERATURE CITED.

BANGS, OUTRAM.

1901. Birds of San Miguel Island, Panama. Auk, **18**, 1901, p. 24–32.

1902. Two New Birds from San Miguel Island, Bay of Panama. Proc. New Eng. Zool. Cl., **3**, p. 71–73.

BANGS, OUTRAM AND BARBOUR, THOMAS.

1922. Birds from Darien. Bull. Mus. Comp. Zool., **65**, no. 6, p. 191–229.

BOUCARD, ADOLPHE.

1878. On birds collected in Costa Rica. Proc. Zool. Soc. London, p. 37–71.

CASSIN, JOHN.

1851. Proc. Acad. Nat. Sci. Philadelphia, **5**, p. 149–154.

CARRIKER, M. A., JR.

1910. An annotated list of the birds of Costa Rica including Cocos Island. Ann. Carnegie Mus. **6**, nos. 2–4, p. 314–915, map.

CHAPMAN, FRANK M.

1917. The distribution of bird-life in Colombia. Bull. Am. Mus. Nat. Hist., **36**, p. I–X + 729 pp., 51 pl., 21 text figs.

1926. The distribution of bird-life in Ecuador. Bull. Am. Mus. Nat. Hist., **55**, p. I–XIII + 784 pp., 30 pl. (incl. map), 20 text figs.

CHERRIE, GEORGE K.

1890. Notes on habits and nesting of *Vireo flavoviridis* Cassin. Auk, **7**, p. 329–331.

1890 A. North American birds found at San José, Costa Rica, with notes on their migration. Auk, **7**, p. 331–337.

COLE, LEON J.

1906. Vertebrata from Yucatan; Aves. Bull. Mus. Comp. Zool., **50**, no. 5 (part), p. 109–146.

DEARBORN, NED.

1907. Catalogue of a collection of birds from Guatemala. Field Mus. Nat. Hist. Publ., Orn. Ser., **1**, no. 3, p. 69–138, map.

DWIGHT, JONATHAN, JR.

1900. Sequence of moults and plumages of passerine birds. Ann. N. Y. Ac. Sci., **13**, p. 73–360.

GADOW, HANS.

1883. Catalogue of the Passeriformes or perching birds in the collection of the British Museum. Paridae; Laniidae; Certhiidae. **8**, i–xiii + 385 pp., 9 pls.

HALLINAN, THOMAS.

1924. Notes on some Panama Canal Zone birds with special reference to their food. Auk, **41**, p. 304–326.

JOUY, P. L.

1893. Notes on birds of central Mexico with descriptions of forms believed to be new. Proc. U. S. Nat. Mus., **16**, p. 771–791.

LAWRENCE, GEORGE N.

1874. The birds of western and northwestern Mexico, based upon the collections made by Col. A. J. Grayson, Capt. J. Xantus and Ferd. Bischoff, now in the Museum of the Smithsonian Institution at Washington, D. C. Mem. Boston Soc. Nat. Hist., **2**, no. 9, p. 265–319.

1876. Birds of southwestern Mexico collected by Francis E. Sumichrast for the United States National Museum. Bull. no. 4, U. S. Nat. Mus. p. 5–56.

MERRIAM, C. HART.

1883. On a bird new to northern North America. Bull. Nuttall Orn. Cl., **8**, p. 213 (specimen picked up dead at Godbout, Quebec, 13 May 1883).

MERRILL, JAMES C.

1878. Notes on the ornithology of southern Texas, being a list of birds observed in the vicinity of Fort Brown, Texas from February 1876 to June, 1878. Proc. U. S. Nat. Mus., **1**, p. 118–173 (*Vireosylva flavoviridis* ♂, Fort Brown, 23 August 1877).

MADARÁSZ, JULIUS V.

1885. Ornithologische Mittheilungen über die Sammlungen des Ungarischen National-Museum. Termes. Füzetek, **9**, p. 84–87, pl. 6.

MÉNÉGAUX, AUGUST.

1911. Mission du Service Geographique de l'Armée pour la mesure d'un arc de méridien equatorial en Amerique du Sud etc. 1899–1906, **9**, Zool., fasc. 1.

NELSON, E. W.

1899. Birds of the Tres Marias Islands. North American Fauna, No. 14 (part), p. 21–62.

NUTTING, C. C.
1882. On a collection of birds from the Hacienda "La Palma," Gulf of Nicoya, Costa Rica (with critical notes by R. Ridgway). Proc. U. S. Nat. Mus., **5**, p. 382–409.

PRICE, WILL. W.
1888. Occurrence of *Vireo flavoviridis* at Riverside, California. Auk, **5**, p. 210 (spec. collected 1 October 1887).

RENDAHL, HJALMAR.
1920. A List of the Birds of the Pearl Islands, Bay of Panama. Ark. Zool., **13**, no. 4, p. 1–54, map.

RIDGWAY, ROBERT.
1904. Birds of North and Middle America. Bull. 50, U. S. Nat. Mus., part 3, p. i–xx + 801, 19 pl.

SALVIN, OSBERT.
1870. On some collections of birds from Veragua. Proc. Zool. Soc. London, 1870, p. 175–219.

SALVIN, OSBERT AND GODMAN, FREDERICK DUCANE.
1879–1887. Biologia Centrali-Americana, Aves, **1**, p. i–xliv + 512. [Vireonidae, Dec. 1881–Feb. 1882.]

SCLATER, PHILIP LUTLEY.
1859. List of birds collected by M. A. Boucard in the State of Oaxaca in southwestern Mexico with descriptions of new species. Proc. Zool. Soc. London, p. 369–393.

STONE, WITMER.
1896. The moulting of birds, with special reference to the plumages of the smaller land birds of eastern North America. Proc. Acad. Nat. Sci. Phila., p. 108–167, pl. 4, 5.
1899. A study of the type specimens of birds in the collection of the Academy of Natural Sciences of Philadelphia with a brief history of the collection. Proc. Acad. Nat. Sci. Phila., p. 5–62.
1918. Birds of the Panama Canal Zone, with special reference to a collection made by Mr. Lindsey L. Jewel. Proc. Acad. Nat. Sci. Phila., p. 239–280.

SUMICHRAST, F.
1869. The geographical distribution of the native birds in the Department of Vera Cruz, with a list of the migratory species. Mem. Boston Soc. Nat. Hist. **1**, 1869, p. 542–563.

TACZANOWSKI, L.
1874. Liste des oiseaux recueillis par M. Constantin Jelski dans la partie centrale du Pérou occidental. Proc. Zool. Soc. London, p. 501–565.
1882. Liste des oiseaux recueillis par M. Stolzmann au Pérou nord-oriental. Proc. Zool. Soc. London, p. 2–49.

TODD, W. E. CLYDE AND CARRIKER, M. A., JR.
1922. The birds of the Santa Marta Region of Colombia: a study in altitudinal distribution. Ann. Carnegie Mus. **14**, p. i–viii + 611, 8 pl.

GENERAL NOTES.

Great Black-backed Gull (Larus marinus) Breeding in Essex County, Massachusetts.—While banding juvenile Herring Gulls with Mr. W. G. Means, on July 7, 1931, at North Gooseberry Island, Salem, Massachusetts, our attention was attracted by the cries of a Black Backed Gull circling overhead. Presently, our inevitable suspicions were confirmed by the discovery of a single juvenile Black-back almost fully fledged. Traces of natal down still persisted on its head, neck, and rump. The dorsal feathers were conspicuously margined with "vinaceous buff" in marked contrast with the more uniformly darker brown back of the young Herring Gulls. Its tail was sufficiently well developed to show the characteristic white banding at the tip and base.

Not wishing to collect the bird without more information about its breeding range, we banded and released it. After consulting Messrs. Griscom and Peters at the Museum of Comparative Zoology, Cambridge, it seemed possible that we had established the first breeding record for the species in the United States. Accordingly, Mr. Means returned to the island on July 9 and collected the young Gull (a male about five weeks old) without difficulty. It has been mounted and given to the Peabody Museum, Salem.

According to A. C. Bent (1921)[1] the southern limit of the breeding range of the species has been considered to be in King's County, Nova Scotia. I can find no published record in recent volumes of 'The Auk' which modifies this opinion. Audubon (1835)[2] considered that "none breed further south than the eastern extremity of Maine," presumably on the islands in the vicinity of Grand Manan where Boardman (1862)[3] and Herrick (1873)[4] reported scattered pairs breeding among Herring Gulls. Stearns and Coues (1883)[5] stated that "some individuals breed in Maine." Apparently Mr. Bent considered these unauthenticated reports of Maine stations too vague to accept and made no reference to them. However, the marked southward extension of breeding Herring Gulls during the past ten years suggests that a Massachusetts occurrence for the Black Back is no mere accident and that recent unpublished accounts of stations along the Maine coast may be uncovered. Mr. Arthur H. Norton of Portland writes that such indeed is the fact, and that data on the breeding of this bird in Maine may soon be expected in publication. Furthermore, it is reported on good authority that Mr. Samuel A. Eliot, Jr., of Northampton, Massachusetts, discovered one or

[1] A. C. Bent, N. A. Gulls and Terns, U. S. Nat. Mus. Bull. 113, p. 79, 1921.
[2] Audubon, Orn. Biog., 306, 1835.
[3] Boardman, Proc. Bos. Soc. Nat. Hist. IX: 131, 1862.
[4] Herrick, Bull. Essex Inst. V, 28–41, 1873.
[5] Stearns and Coues, N. E. Bird Life, II: 347, 1883.

two mated (?) pairs and one well-grown juvenile bird at Little Duck Island, Mt. Desert, Maine, on July 15, 1931.

From the foregoing, it is highly probable that the Black-backed Gull within a very few years, if not in 1931, has made the first definite southward extension of its breeding range since Audubon's time. In all likelihood, this may be attributed to a marked increase in the Gull population in northeastern United States.—RICHARD J. EATON, *53 State St., Boston, Mass.*

Breeding of the Great Black-backed Gull and Double-crested Cormorant in Maine.—During an inspection of the bird colonies on the coast of Maine, made under the auspices of the National Association of Audubon Societies, from June 23 to July 14, 1931, we found the Great Black-backed Gull (*Larus marinus*) breeding at ten different stations along the coast. With but one exception these breeding places were islands upon which there were also nesting colonies of Herring Gulls (*Larus argentatus*). The exception was Egg Rock, in West Penobscot Bay, where one pair of *Larus marinus* and two young of that species were found. On this same rock, a tiny island less than 100 yards in length, we counted 9 nests of the Eider (*Somateria mollissima dresseri*). The usual number of these Gulls breeding at each of the ten stations was one pair, two breeding pairs being found on only three islands: the Brothers, Cone Island, Little Duck Island. In all 13 pairs of breeding birds were observed. The nests always occupied elevated positions, commanding a view of the surrounding land and sea. The young were more advanced than the majority of young Herring Gulls, and in every instance were in early juvenal plumage. All of them could run with considerable speed, in spite of a certain awkwardness, and many took to the water upon being disturbed, swimming short distances off-shore with great facility. In one instance, at Hardhead, one which had swum well off-shore was seen to rise against the light breeze and fly to windward to join its parents, which persistently kept still farther up-wind, evidently encouraging the young one to overcome the leeward drift until it could reach shore and land once more.

According to our observations, the station farthest west upon which *Larus marinus* was found breeding was Northern White Island, belonging to the town of Boothbay, in Lincoln County. One young Gull of this species was discovered hiding among the rocks close to shore. When released he took to the water, and as he swam off-shore the two adults followed, flying in circles and zig-zags over him, sounding their characteristic low, hoarse notes, and an occasional high, screaming *ki, ki.*

Following is a list of the islands where *Larus marinus* was breeding: Double-headed Shot; the Brothers; Cone Island; Little Duck Island; Green Island (off Swan's Island); Hardhead Island; Spoon Ledge; Egg Rock (West Penobscot Bay); Yellow Ledge; Northern White Island. These islands are scattered from the region of Machias Bay to the western proximity of Pemaquid Point, roughly a distance of about 140 miles. It is very likely that *Larus marinus* is breeding on Elm Island, in Casco

Bay, but we did not find sufficient proof to allow us to claim this record.

To the best of our knowledge these instances, and the like discovery recently made farther west by Mr. R. J. Eaton, of Boston, Massachusetts, constitute the first definitely established breeding records for the species in the United States.

It is probable, however, that the bird has been breeding on the coast of Maine for a few years previous to the present.

April 19, 1923, one of us saw a Gull of this species on the grassy ground of Double-headed Shot, evidently guarding a nesting claim against the Herring Gulls, which were beginning to assemble for the breeding season. A report was made to one of us, by a man well acquainted with the Gulls of the region, and their habits, of an unusually large nest with large eggs, near which a pair of these Gulls showed much solicitude. This was on Little Spoon Island, Jericho Bay, about the year 1916.

A careful consideration of early reports shows them to be dubious. Audubon's statement, that, "None breed south of the eastern extremity of Maine"[1] is too vague to be of use as a possible record.

In 1862 Boardman stated: "A few breed about the Islands."[2] His use of the term, "the Islands" was made without regard to political boundaries, and cannot be used as a basis for a State record.

Professor Verrill's statement,[3] made the same year, that, "A few appear to breed on the Islands in the Bay of Fundy—G. A. Boardman" removes any question of the possible pertinence to Maine that might be attached to Mr. Boardman's statement. Yet it clearly was upon this that Dr. Coues based his claim for the breeding of the species in New England in 1868.[4]

Harold Herrick,[5] writing of the birds of Grand Manan, New Brunswick, in 1873, said of that region and time: "Used to breed with the Herring Gulls, but being of a wilder nature, it was the first to move in the direction of new and more secure breeding grounds." It thus appears that early in the seventh decade of the nineteenth century, this Gull had retired from the vicinity of the eastern part of the Maine coast.

Ten years later, "New England Bird Life" by Stearnes and Coues, was published, wherein appears a statement that "Some individuals breed on the coast of Maine."[6]

It seems extremely probable that Dr. Coues in editing the work in question, truly an excellent work, had drawn upon his earlier list, where his data were taken from the 1862 Boardman statement; and equally probable that his heated debate with Dr. T. M. Brewer over the subject of New England birds, led him to add force to the claim for the breeding

[1] Audubon, Orn. Biog., III, 306, 1835.
[2] Boardman, Proc. Boston Soc. N. H., IX, 131, 1862.
[3] Verrill, Proc. Essex Inst., III, 159, 1862.
[4] Coues, Proc. Essex Inst., V, 306, 1868.
[5] Herrick, Proc. Essex Inst., V, 40, 1873.
[6] Stearnes and Coues, New Eng. Bird Life, II, 347, 1883.

of this bird, since Dr. Brewer[1] had mentioned it only as a winter resident.

That this New England Bird Life claim was not based upon new data is apparent from a consideration of the contemporary works of Everett Smith, 1883, and Baird, Brewer and Ridgway, 1884. Mr. Smith had been stationed at Machias in the service of the U. S. Coast Survey, and had corresponded and traveled extensively on the coast in gathering the material for his 'Birds of Maine.'[2] Prof. Baird, who read the proof of the great work cited, had been at various places along the coast of Maine in the capacity of superintendent of the U. S. Fish Commission Surveys, and had on his force several young men keen in exploration and interested in ornithology. Moreover, he had an extensive correspondence with the best informed men of that time, at points all along the coast.

Smith[2] stated positively that none of these Gulls bred in Maine, and the 'History of North American Birds'[3] stated that none bred west of the Bay of Fundy. We have reviewed these early reports and the data upon which they rest at some length, since there seems to be a need of having them fully considered and disposed of correctly in this connection.

Another observation of interest had to do with the extended nesting area of the Double-crested Cormorant (*Phalacrocorax auritus*), as well as a decided increase in the numbers of breeding birds. More than 1700 breeding adults were found in five distinct colonies. The largest of these contained 1000 adults, and the smallest eight. All except those on Old Man Island, the largest colony, were nesting flat upon the rocks and ledges. On the Old Man the nests were built high in dead spruce, with from one to seven nests in a single tree. Eggs and young were found in all stages of development. A summary of the breeding colonies that were observed, follows: Old Man Island, 1000 adults; Pulpit Rock, 100 adults; Spoon Ledge, 40 adults; Marblehead Rock, 600 adults; Old Hump, 8 adults.

The nesting of the Eider (*Somateria mollissima dresseri*) seems likewise to be on the increase along the Maine coast. In the course of our inspection, 165 adults, 25 broods, and 27 nests were counted. These nests, like those of *Larus marinus*, were built on commanding elevations. Most of them had hatched, but a number contained incubating eggs.

Conditions with reference to other breeding species may be summarized as follows:

Puffin (*Fratercula arctica arctica*)—Breeding on two islands.
Black Guillemot (*Cepphus grylle*)—Breeding generally along the coast.
Razor-billed Auk (*Alca torda*)—Breeding on Machias Seal Island.
Herring Gull (*Larus argentatus*)—Breeding in 77 separate colonies.
Laughing Gull (*L. atricilla*)—Breeding in one colony.
Common Tern (*Sterna hirundo*)—Breeding in 20 colonies.

---

[1] Brewer, Proc. Boston Soc. N. H., XVII, 449, 1875.
[2] Smith, Forest and Stream, XX, 204, 1883.
[3] Baird, Brewer & Ridgway, Hist. N. Am. Bds., Water Bds., II, 227, 1884.

Arctic Tern (*S. paradisea*)—Breeding in 6 colonies.

Roseate Tern (*S. dougalli*)—Breeding in 3 colonies.

Leach's Petrel (*Oceanodroma leucorhoa leucorhoa*)—Breeding generally along the coast, but not as numerous as previously.

Great Blue Heron (*Ardea herodias herodias*)—Breeding in 7 colonies.

Black-crowned Night Heron (*Nycticorax nycticorax naevius*)—Breeding in 1 colony.

For the last 27 years the National Association of Audubon Societies has employed wardens to guard the more important bird colonies on this coast. It is interesting to view the changes that have been wrought through the protection thus afforded. Herring Gulls have increased to such numbers that they are now a menace to the Terns, and in many instances have usurped their breeding grounds. The first definite records of the breeding of the Great Black-backed Gull, and the very great increase in the number of breeding Cormorants, are both significant facts. Under protection the Eider is coming back, but the same care seems of no benefit to the little Leach's Petrel, which appears to have decreased even more alarmingly than have the Terns, and for no apparent reason. Conditions in general, show that much may be accomplished through the combining of protective laws and warden service. We found breeding colonies of water birds on one hundred and eleven of more than two hundred islands inspected.—Arthur H. Norton and Robert P. Allen, *National Association of Audubon Societies, 1775 Broadway, New York, N. Y.*

Bird Predators of Common Tern.—A male Snowy Owl, *Nyctea nyctea*, was shot at Lone Tree Island, Michigan, on June 11, 1931. This bird was sighted at dusk on June 10, leaping at intervals of a few hundred feet. Apparently, the bird stayed on the island the whole night preying on Common Terns as the head and the tips of the wings of the latter were recovered from its stomach at 4:30 A.M. The Owl was thin and together with its unusual docility suggested that it was sick. This record of capture appears to be unusual for this region.

On June 12, a Crow, *Corvus brachyrhynchos*, was killed at about the same spot. Egg shells and albuminoid materials suggestive of those of the Common Terns were recovered from the stomach. This solved the mystery of the punctured eggs observed almost every morning during the last three nesting seasons.—C. G. Manuel, *Museum of Zoology, University of Michigan.*

Water-Turkey Nesting in North Carolina.—While on a recent field investigation trip to various bird colonies for the National Association f Audubon Societies, the following observation was made.

On May 24, 1931, at Crane Neck on Orton Pond, situated about fifteen miles below Wilmington, N. C., a Water-Turkey (*Anhinga anhinga*) was flushed from a nest containing three eggs, about fifteen feet above the water in a small cypress. The only other record of an actual nest of this

bird in North Carolina comes from the same locality. In Tom Branch of Orton Pond, June 7, 1898, Dr. T. Gilbert Pearson found the first nest to be discovered in the State. This nest contained four "much incubated eggs." Again in 1904 he observed the Water-Turkey on Orton Pond, but found no nests ('Birds of North Carolina,' Pearson, Brimley, Brimley; p. 46).—ROBERT P. ALLEN, *National Association of Audubon Societies, 1775 Broadway, New York, N. Y.*

Double-crested Cormorant in the Chicago Area.—On April 11, about 4:30 P. M., three Double-crested Cormorants (*Phalacrocorax auritus auritus*) were observed flying over a lagoon in Jackson Park, Chicago. The Cormorants flew over the lagoon in wide circles alighting temporarily in some trees along the lagoons, but were disturbed apparently by the heavy traffic on the automobile drives which encircle the lagoons. They finally gave up their attempts and flew away at dusk.—JAMES G. SUTHARD, *117 W. Austin Ave., Chicago.*

Rare Birds in Lancaster Co., Pa.—On April 19, 1931, I saw one Old Squaw (*Harelda hyemalis*) on the Conestoga River at Slackwater, Lancaster County.

On May 21, 1931, at Oregon Pond, Lancaster County, in company with C. L. Fasnacht and D. E. Adams, I got a very fine view of a mature female Wilson's Phalarope (*Steganopus tricolor*) in full summer plumage. This is the second record of this bird in the county, the first being that of May 3, 1893, by Dr. M. W. Raub.

On May 23, 1931, at Oregon Pond I saw a flock of 25 or 30 Semipalmated Plover (*Aegialitis semipalmata*). Among them was one Red-backed Sandpiper (*Pelidna alpina sakhalina*). The Red-backed Sandpiper has not been seen in this county since 1869, when it was reported by Judge J. J. Libhart. This rare flock in the county was probably driven in by a storm the night before. The Semipalmated Sandpiper is more common in September than in the Spring, in Lancaster County.—W. STUART CRAMER, *44 E. Orange St., Lancaster, Pa.*

American Egret in Connecticut.—An American Egret was observed by the writer on the shore of the Stamford Reservoir, near High Ridge, Connecticut, on August 1, 1931.—WILLIAM VOGT, *Hastings-on-Hudson, N. Y.*

Yellow-crowned Night Heron in Ohio.—On the afternoon of April 25, 1931, Robert M. Bruce and I were watching migratory Ducks on the extensive marshes in the southwestern section of Wayne County, some seven miles southwest of Wooster, in the valley of the Killbuck. As we were penetrating a long strip of boggy woods our attention was attracted by a Heron which left the treetops overhead and flew to a large elm tree where it alighted on a horizontal limb, some distance from the ground but hardly more than twenty-five yards from where we stood. The

bird was immediately recognized as a Yellow-crowned Night Heron (*Nyctanassa violacea*) in adult plumage. Although the sun was obscured by clouds the hour was early and the light good, and as the trees at that date were still devoid of foliage an excellent view was obtained. The uniform heavy gray underparts and wings, the black and white head striping were noted, and with the aid of binoculars the pendant head plumes and yellow crown were plainly visible.

There is only one other published record of this species for the state, that of a breeding pair at Licking Reservoir in 1928.—James Bruce, *Wooster, Ohio.*

Abnormal Sets of Heron Eggs in Coastal South Carolina.—During banding operations carried on by Mr. E. Milby Burton and the writer amid the Heron rookeries of the low country of South Carolina, our interest has been aroused by the not infrequent finding of large sets of eggs in one particular colony. Some of these have already been recorded in 'The Auk,' (Vol. XLVI, 555 and Vol. XLVII, 576) both instances coming from a marshland rookery located near James Island, Charleston County, S. C. While banding in this same rookery during the current season, seven more abnormally large sets were found, six of six eggs and one of eight eggs; the owners of these nests were not actually seen on the eggs but Herons of three species were on the island, viz. Snowy, Louisiana and Little Blue.

It seems strange that this small island, about three or four acres in extent, should be the only rookery in the low country examined by us to exhibit these abnormally large sets. In the cypress swamp colonies this has never as yet been noted. If it is a result of two females using the same nest why is not this done in other localities? Only this salt marsh hammock has revealed such a habit, if habit it is.

One other nesting abnormality transpired during July 1931, in the finding on a bank in Stono Inlet, of a nest containing five eggs of the Black Skimmer (*Rynchops nigra*) and three eggs of the Least Tern (*Sterna antillarum*).—Alexander Sprunt, Jr., *92 South Battery, Charleston, S. C.*

Nesting of the Sandhill Crane in Calhoun County, Michigan.—On May 3, 1931 I visited the marsh in Convis Township, Calhoun County where the Sandhill Cranes (*Grus mexicana*) were found during the month of August, 1930. Here after many hours of wading among cat-tails and reeds I flushed two Cranes. They flew low, allowing an especially good view of their coloration, then alighting down in the swamp where their loud rolling call could be heard for some time. Soon one returned to a spot only about four rods from me where she walked along drooping her wings with a quivering motion as if to draw me away from a nest. A short search did not reveal the nest so I returned early on the morning of the 5th. Almost as soon as I appeared in sight, near where the birds had been two days before, a single bird rose in front of me and as before flew down the marsh uttering the peculiar call. It required only a short time

to locate the nest, a flat mound of sedge, about three feet in diameter, built among the clumps of sedge and reeds. There were two eggs, one of which was an oval shape while the other was more elliptical. The former, when measured, later, proved to be 94.5 x 60.75 mm. and was a pale buff streaked with long splotches of brown, lavender and darker buff, which extended along the whole length of the egg but was more concentrated near the large end. The other egg was darker in color with the spots more definite in outline and placed around the large end almost in a wreath. It measured 93.5 x 61.5 mm.

For some reason the birds deserted the nest during the week May 10–17 but when I returned on the 24th they were found in a spot farther down the swamp where they were probably nesting again although I did not search for the nest.—LAWRENCE H. WALKINSHAW, *Battle Creek, Michigan.*

Notes from Southern Alabama.—I should like to record the second occurrence of the Hudsonian Curlew (*Numenius hudsonicus*) in Alabama. On April 12, 1931 the wings of a bird of this species were picked up on the Alabama Gulf Coast south of Foley. They were sent to the Biological Survey and there identified. Howell in his 'Birds of Alabama' says: "The only Alabama record is that of a specimen shot by E. G. Holt from a flock of nine at the west point of Dauphin Island, July 27, 1913."

Another rare species for Alabama was noted twice by Duncan McIntosh, who on April 6 and 23, 1931, saw a male Painted Bunting (*Passerina ciris*). Howell has one record from Alabama, a male "seen by Dr. A. K. Fisher, May 13, 1886, in the northern suburbs of Mobile."—HELEN M. EDWARDS, *Fairhope, Ala.*

Notes on Bird Life in Southern Florida.—On April 26, 1931, I called at the camp of the warden in charge of the Shark River country, and found that he had moved over to East River, off White Water Bay. There was practically no bird life along Shark River or any of its tributaries (all of which I visited) as far as I could go in a skiff. I did not see anything but scattered flocks of Herons (Louisiana and Florida Blues). There were several flocks of Teal and a few Fish Eagles.

We went the entire length of White Water Bay and through Coot Creek into Coot Bay, without seeing any signs of bird life except a few Bluebills and Sheldrake. We also observed one Fish Eagle's nest where they were feeding the young, at the entrance of White Water Bay.

We then went to East River. I went up as far as I could go in a cruiser—about one mile from White Water Bay. There were a few Herons on the flats and with my glasses I could see quite a number of Wood Ibises circling four or five miles farther up the stream. It was this rookery that the warden was protecting. I was told that the birds had all moved farther back into the Everglades on account of food conditions.

The route through White Water Bay and Coot Bay was the one formerly used by the plume hunters to reach the rookery I described previously. It can now be reached through the drainage canal, east of East Cape.

There is a portage of about a mile and a half, from Coot Bay to the Lake on which this rookery is located, which was formerly used before the drainage canal route was available. As I saw no birds circling over the rookery, I presumed it is still deserted.

I returned to Coon Key on May 1 and in the mangroves adjoining Blue-bill Bay, off Marco River, I disturbed a flock of Roseate Spoonbills, which circled over me. I counted over seventy in the flock which, I think, is the largest flock seen in that country for a number of years.

On one of the reefs, about a mile distant from Coon Key, I saw a flock of eight Oyster-catchers. I was told that there was another flock of about the same size on one of the other reefs near Cape Romain; also, several very large flocks of Terns on the sand bars off the same Cape.

Going farther north, I noticed a very large colony of Man-o'-war Birds on one of the islands near the entrance of Blind Pass. At the entrance of Captiva Pass, the sand bar which has been formed by the results of the storms of the past few years, was covered with Terns and Skimmers.

In general, the number of wading birds seen by me was less than on any trip I have made over this country in the past ten years. The explanation given by the natives is that the birds have moved farther back into the Everglades for nesting purposes and on account of a more abundant supply of food.—Eugene R. Pike, *Tower Building, Chicago, Ill.*

A Knot (Calidris canutus) in Montgomery County, Ohio.—About an hour before sunset on August 17, 1927, on a visit to the lake at Englewood dam, about eight miles north of Dayton, Montgomery County, Ohio, I observed seven Knots (*Calidris canutus*) in a mixed flock of shorebirds. They appeared to be resting, as they stood quietly in a little group on a mud-flat. Their nearest associates were about a dozen Yellow-legs, a Stilt Sandpiper, five Dowitchers, and two Pectoral Sandpipers; nearby were a score of Semipalmated Sandpipers, a single Least, ten Killdeers and four Semipalmated Plovers. Altogether a remarkable shorebird assemblage in this part of Ohio. None of these birds was more than fifty or sixty feet from where I sat and all were actively feeding; the inactivity of the Knots was as conspicuous as was their lack of definite plumage markings. At such close range they were easily studied with 8x glasses for half an hour. In comparing them with other species present I found that in form they more generally resembled the Dowitcher except the bill was shorter; in coloration they were of a more uniform gray on the back, sides and breast than the Yellow-legs, and the legs were darker. I am aware of no other record for this species from the interior of Ohio since the days of Wheaton (1878).—Ben. J. Blincoe, *Dayton, Ohio.*

The Hudsonian Godwit in the Dominican Republic.—Dr. R. Ciferri, Director of the Experiment Station at Santiago, D. R. has presented to the U. S. National Museum a specimen of the Hudsonian Godwit *Limosa haemastica* taken September 22, 1930, on the flats of the Río Yaque

del Norte, near Hato del Yaque, Province of Santiago, Dominican Republic, by Mr. E. Ciferri. Dr. Ciferri writes that a flock of thirty of these birds appeared following the severe hurricane of the season in question, and that four were taken. The species has been only casual in occurrence in the West Indies, and is here first reported for either the Dominican Republic or Haiti where its capture raises the total number of forms of birds definitely known for that island and its dependencies to 217.—ALEXANDER WETMORE, *U. S. National Museum, Washington, D. C.*

Wilson's Phalarope (Steganopus tricolor) in South Carolina.—It is with pleasure that the writer is able to record the capture of the second specimen of *Steganopus tricolor* for the State of South Carolina, on May 15, 1931. The circumstances surrounding the taking of this bird are of considerable interest. In 'The Auk,' Vol. XLVI, 383, Mr. Herbert R. Sass records the sight observation of *S. tricolor* in a small pond on Sol Legare Island, near Charleston, on May 11, 1929. This bird, a female, remained in the pond for several days, leaving as near as the writer can recall, on May 13. On May 13, of this year Mr. Sass again saw the species in the same pond, two years to the day from the time the former specimen seen there, left.

On May 15, the writer, in company with Messrs. Peter Gething and John Slocum went to Sol Legare Island to look for the Phalarope and saw it in the pond together with another individual. A long shot by the writer missed the one aimed at and both flew off. Separating then, the three of us scoured the island in hope of locating the birds again and in about an hour, Mr. Gething secured one of the birds in a nearby pool. It is a female in very high plumage and constitutes the second specimen to be actually taken in South Carolina. Thus, the pond on Sol Legare Island has yielded another rare shore-bird to records of the State, other species taken there being Golden Plover (*Pluvialis dominica*) and Stilt Sandpiper (*Micropalama himantopus*) while the Black-necked Stilt (*Himantopus mexicanus*) was seen but not taken.—ALEXANDER SPRUNT, JR., *South Battery, Charleston, S. C.*

Red Phalarope in Ocean County, N. J.—A splendid specimen of the Red Phalarope (*Phalaropus fulicarius*) in adult female summer plumage, was seen to excellent advantage at the North Point Flats of Barnegat Bay, on May 26, 1931. So unsuspecting was the bird, that members of the party were able to approach to within ten feet, while it floated on the water and picked at the surface. Several times it flushed, only to come back to the same spot, where it seemed to be attracted by food banked close against a sand bar by a slight breeze. The entirely red underparts, white side of head, yellowish bill (thicker than a Northern Phalarope's—*Lobipes lobatus*) with dark tip, were all clearly noted. A call, resembling that of a Northern Phalarope, was heard.—GLADYS GORDON FRY, CYNTHIA DRYDEN KUSER, CYNTHIA CHURCH, and LAIDLAW WILLIAMS, *Princeton, N. J.*

Black Vulture nesting in Washington Co., Tenn.—In the January issue of 'The Auk,' there was a General Note: "The Black Vulture in Tennessee Mountains," and it may be of interest to know that on May 2, 1931, I found a pair of Black Vultures nesting on the Watauga River, Washington County, northwest of Johnson City, Tenn. Their eggs were deposited on a few leaves and sticks in a small cave or hole at the top of a rather high bluff bordering the river. For four years, I have watched these birds but only this year have I been fortunate enough to locate their breeding place. Their range seems to be confined to about six miles along this stream, as I have never seen one at any other point near here although the Turkey Vulture can be seen in many places.

I would also like to report a pair of Peregrine Falcons breeding southeast of here on the Nolachuckey River, Unicoi County, Tennessee, and although in an inaccessible place, I have had excellent opportunity for observation. Three birds were reared both this year and last.—ROBERT B. LYLE, *4 Cumberland Apts., Johnson City, Tenn.*

The Black Vulture in Greenbrier County, West Virginia.—Having found the Black Vulture (*Catharista urubu urubu*), as early as 1919, nesting at 3,400 feet elevation above sea level on the eastern edge of the Alleghany Mountain range in Rockbridge County, Virginia, and only about 30 miles to the southeast of the nearest point in West Virginia (Auk, 1929, p. 385), its occurrence occasionally in neighboring regions of West Virginia seemed very likely; however, my hunt for it, until November, 1929, did not pass beyond a subconscious watchfulness whenever I visited adjacent parts of West Virginia. It was then that I learned from natives of Giles and Tazewell Counties, Virginia, that two kinds of buzzards had been seen there, within a few miles of the West Virginia boundary, for several years past. With this information in hand, it seemed only necessary to set a carrion feast on the West Virginia side of the state line in order to induce a few of the black-headed fellows to set their wings and sail west a few miles in order to establish a new state record for their occurrence.

An opportunity to carry out such a plan did not present itself until the following summer. On July 3, 1930, preparatory to making a trip into Monroe and Mercer Counties, West Virginia, to look for Black Vultures, I visited my old home, just west of Lewisburg, in Greenbrier County. Unknown to me a sizeable hog had died on the farm the day before my arrival and had been hauled out for the Vultures to feast upon. As I stepped from my automobile, relatives were not the only ones to greet me; an escort of ten or more Turkey Vultures circled low overhead. There, circling at close range and somewhat apart from the others, were also five Black Vultures.

The group gained altitude rapidly. The Turkey Vultures soon sailed away while the Black Vultures continued to climb until fully a quarter of a mile above the earth. They then sailed off towards the west. At this time another group of three Black Vultures was sighted at about the same

altitude but a little to the east of the position of the former group. After circling a few times they took a course toward the south.

I found the carcass of the hog by this time had been pretty well stripped of flesh. Although there were a number of Turkey Vultures sitting on the ground and trees near by, there were no Black Vultures among them. However, when I visited the vicinity the following day I saw two Black Vultures circling at close range accompanied by four Turkey Vultures.

As far as I am aware the eight Black Vultures seen by me on July 3 constitute the first record for the occurrence of this bird in Greenbrier County, and for that matter, in West Virginia. The point of occurrence is approximately ten miles west of the summit of the Alleghany Mountain range on the plateau 2,100 feet above sea level.

The Turkey Vulture is a common, permanent, resident in the region of Lewisburg, W. Va. On several occasions during my boyhood, I recall having seen bands of five hundred or more gather to feed on the carcass of some dead animal. My father told of having seen fully two hundred roosting in the sugar maple grove near the hog carcass at dusk on July 2, 1930.—Chas. O. Handley, *Ashland, Virginia.*

The Black Vulture (Coragyps urubu) at Harpers Ferry, West Virginia.—A Black Vulture was seen by the writer soaring overhead in a flock of forty Turkey Vultures (*Cathartes aura septentrionalis*), at the junction of the Potomac and Shenandoah Rivers, at Harpers Ferry, West Virginia, on the morning of April 12, 1931, at 6:30 A.M. The short, square tail and the gray patches at the end of the wings were easily discernible. The Rev. Earle A. Brooks informs the writer that there is but one other bona fide record for West Virginia.—W. Howard Ball, *1861 Ingleside Terrace, N. W., Washington, D. C.*

Marsh Hawk vs. Coyotes.—On May 24, 1931, while driving between Los Banos and Dos Palos, California, at about 6:00 A.M., two coyotes crossed the road about one hundred feet in front of the car. Directly above them in the air was an adult male Marsh Hawk (*Circus hudsonicus*) which swooped down on them continually. Though the animals soon disappeared in the sage brush, my companion and I were able to trace their route through the brush by the actions of the bird which followed just above them attacking continually until out of our sight.

There were immature young Marsh Hawks already on the wing in the vicinity, and the adult bird was probably concerned about their safety, as no doubt the coyote would not hesitate to eat wild "poultry" of this kind.—Emerson A. Stoner, *Benicia, California.*

Barn Owl nesting in Springfield, Mass.—Another extremely interesting record for the Connecticut Valley in Massachusetts is that of a pair of Barn Owls (*Tyto alba pratincola*) found nesting this spring in the belfry of the North Congregational Church of Springfield. When the young birds were quite well grown some boys inadvertently climbing into the

steeple discovered the young Owls and attacked them with sticks, driving at least one of them out into the street below, where it was injured. Mr. Thornton Burgess investigated and sent the bird to Miss Coburn's bird hospital at Sixteen Acres, where it has convalesced and become a great pet. In comparatively recent years a Barn Owl has now and then been reported in or near Springfield, so that undoubtedly they have nested here for some time.

The outstanding bird of this year's spring migration was a male Prothonotary Warbler discovered by Samuel A. Eliot, Jr., of the Smith College faculty, in a swampy woodland on the southern edge of Northampton on May 27. We both visited the location next day and were rewarded by finding the bird still there, singing continuously.

On June 3 both of us visited the swamp land in that section of Old Deerfield, Franklin County, known as "The Bars." Along the eastern edge, well lined with undergrowth and thickets we had an unusual observation for the region in a male Yellow-breasted Chat, that gave us a number of his characteristic and inimitable calls and notes. Bobolinks we found thereabouts in goodly numbers.—AARON C. BAGG, *72 Fairfield Ave., Holyoke, Mass.*

The Generic Name Calao.—Bonnaterre in his 'Tableau Encyclopédique,' Ornithologie I, 1792, p. 300–307, 399–402, lists the Hornbills under Linne's generic name *Buceros*, and calls them "Calao" as a French vernacular name. On the other hand, in his key to the genera (l. c., introduction, p. LXXXVIII) he calls the Hornbills by the generic name *Calao*, and the vernacular name "Buceros." I personally assume that an erroneous transposition of names has occurred in the latter place, but Dr. C. W. Richmond believes that the generic name *Calao* has thus been established according to the requirements of nomenclature. In the 'Nomenclator Animalium' (Berlin 1927, p. 489) Bonnaterre's generic name has also been accepted.

As the typical species for Bonnaterre's genus has not yet been fixed, I select *Buceros rhinoceros* Linn. as its type. *Calao* thereby becomes an absolute synonym of *Buceros* Linn. with the same type species.

In the year 1850, Bonaparte introduced the genus *Calao* for some of the East Indian Hornbills, but to the same group of birds Reichenbach (in 1849) had already given the name *Rhyticeros*. There is some doubt about the publication of Reichenbach's 'Avium Syst. Nat.' and some authors have assumed that the name *Rhyticeros* was not published before 1852 or 1853. But Dr. C. W. Richmond kindly informs me that the actual date of publication of plate L of the 'Av. Syst. Nat.' was December, 1849.

In consequence the nomenclature and synonymy of the two genera will be as follows:

GENUS **Buceros** LINNÆUS

Buceros LINNÆUS, 1758, Syst. Nat. ed. 10, v. I, p. 104. Type (by subsequent design.): *Buceros rhinoceros* LINNÆUS.

Calao BONNATERRE, 1792, Tableau Encycl. méth., Ornithologie, I, p. LXXXVIII. Type (by subsequent designation in the present paper): *Buceros rhinoceros* LINNÆUS.

GENUS **Rhyticeros** REICHENBACH

Rhyticeros REICHENBACH (Dec.) 1849, Av. Syst. Nat. pl. L. Type (by monotypy): *Buceros undulatus* SHAW = *Rhyticeros plicatus undulatus* (SHAW).

Calao BONAPARTE, 1850, Conspec. Gen. Av., I, p. 90. Type (by subsequent designation, Salvadori, 1880, Orn. Pap. Mol. I, p. 392): *Buceros plicatus* LATHAM [nec *Calao* Bonnaterre 1791].—ERNST MAYR, *Amer. Mus. Nat. Hist., New York.*

Belted Kingfishers wintering in the Yellowstone National Park.—Although the snowfall is fairly heavy in the Yellowstone Park, and the winters are long and cold, many of the streams that receive hot water from the numerous hot springs and geysers remain open all winter and do not freeze. While this heat is sufficient to prevent freezing, it is not great enough to be unpleasant to the trout living in these streams. Neither is the comparatively small amount of mineral matter in the hot water injurious to the fish in any way.

Since there are trout in the water, and since there is no ice, Belted Kingfishers can remain all winter and secure ample food unhampered by the severe cold. Every year there are Kingfishers wintering along the Gibbon, Firehole, Gardiner and Yellowstone Rivers within the boundaries of the Yellowstone Park. The coldest days (as measured by the official government Fahrenheit thermometers) on which I knew these Kingfishers were present were: Jan. 22, 1915, 8 degrees below zero; Jan. 25, 1915, 18 degrees below; Jan. 31, 1918, 32 degrees below; Feb. 19, 1918, 17 degrees below; Jan. 11, 1921, 15 degrees below; Dec. 14, 1922, 16 degrees below; Jan. 30, 1923, 12 degrees below. Although these birds were less often seen during stormy weather, many of them were actually seen, or heard, during snowstorms.

With such an array of observations as this at extreme low temperatures throughout so many different years, it becomes evident that these winter occurrences are the regular thing and not mere accidental happenings. The majority of these winter birds were males, and every one was full of life and vigor, even on the coldest and stormiest days. Naturally, the extreme temperatures occurred during the night when the birds were roosting. Possibly, the Kingfishers slept in their nest burrows in gravel banks where they would be sheltered, and the temperature higher than it was outside.

I believe that additional observations will show that Belted Kingfishers will winter wherever there are fish to be had, no matter how cold the temperature, or stormy the weather.—M. P. SKINNER, *Long Beach, Calif.*

Tragedies among Yellow-billed Cuckoos.—The Yellow-billed Cuckoo seems especially prone to run its head against windows if I may judge by five instances that have come to my attention. The first one to do so, whose skin is still in my collection, killed itself on June 13, 1876, by flying against a window in Jamaica Plains, Massachusetts, as did also another at the same window on June 9, 1878. A third committed suicide on June 10, 1904, against a window of Mr. William Brewster's museum in Cambridge. All of these were females. On May 30, 1931, one was found dead close to my house at Ipswich, and another came to its end about the same time at West Newton, Mass., and was reported to me by Mr. Sidney L. Beals at whose house it occurred. He writes that at 4:30 P. M. the bird "flew against the lower half of a second story window with force enough in the impact to be heard all over the house," and dropped onto the tin roof of the porch where it soon died. There was no light in the room and no window opposite, although a book case with glass doors faced the window about a dozen feet away.

Each of the last two birds had the lower mandible broken across near the middle, and, in the Ipswich example, there was blood at the commissure, the upper mandible was broken at the base and there were small hemorrhages under the skull. My older specimens, however, show intact bills.

Yellow-billed Cuckoos are rare at Ipswich, although a pair probably nested on my place this summer—this in addition to the bird that was killed—and were seen and heard through June. This is the first time I have found them anywhere in the neighborhood. Black-billed Cuckoos are common, but I have never met with similar tragedies in that species. The restriction of the accident to the Yellow-billed Cuckoo is probably merely a coincidence, but certainly a strange one.—CHARLES W. TOWNSEND, *Ipswich, Mass.*

How the Nighthawk Moves its Eggs.—One day last July I was afforded the unusual pleasure of seeing a Florida Nighthawk (*Chordeiles minor chapmani*) move its eggs. This feat was accomplished with an awkward shuffling movement of the bird's feet and body against the eggs. The beak and capacious mouth had no instrumental part whatever in the performance.

The nest site in this instance was the gravel roof of a building in downtown Jacksonville. The eggs were laid about two feet from a brick wall on the west side of the roof, and were not moved during the first week I had them under observation. Shortly after noon on July 18 I noticed the bird standing over her eggs, panting, with mouth agape, and shifting about restlessly instead of sitting motionless on them as she always had before. Presently she took wing and sallied out over the adjoining buildings, alighting a minute or so later near the "nest."

The wall nearby had just begun to cast a shadow on the roof as the scorching midday sun eased across the zenith, and the eggs lay some six

or eight inches away from the narrow strip of shade. Waddling up to the eggs, the bird then shoved them along, in the manner related above, a foot or more over into the cool of the shaded area and peacefully resumed her task of incubating.—S. A. GRIMES, *Jacksonville, Fla.*

Arkansas Kingbird at Roxbury, Wisconsin.—On May 31, 1931, while driving on a road near Roxbury (Dane County), I noticed a bird, suspiciously like an Arkansas Kingbird (*Tyrannus verticalis*), alight on a stake in a recently planted corn field. As soon as I could secure my glasses the identification was confirmed. After pursuing the bird across the field, during which process it alighted on the ground several times, it was collected. It proved to be a male, weighed 40.2 grams, and was in excellent plumage except for worn tail feathers. Both mandibles were caked with clay as though it had been unearthing insects. This is the third occurrence for the state, all the records being from Dane County.—A. W. SCHORGER, *168 North Prospect Avenue, Madison, Wisconsin.*

Northern Crested Flycatcher in Western Panama.—A Correction. Examination of the proofs of the new A. O. U. 'Check-List' shows me what I should have known before, that in separating the Crested Flycatcher of Florida, Mr. Bangs described the northern and not the southern bird on which the name *crinitus* Linnæus was based. My record of this species from western Panama[1] therefore refers to *Myiarchus crinitus boreus* Bangs not to *Myiarchus crinitus crinitus* Linnæus.—FRANK M. CHAPMAN, *American Museum of Natural History, New York.*

An Albino Empidonax.—I have lately had the pleasure of examining an interesting partial albino Traill's Flycatcher, *Empidonax trailli* (probably *alnorum*) from the collection of Dr. D. A. Dery of Quebec City who courteously submitted it for examination. It was taken by a local taxidermist near St. Bridgit de Laval, Montmorency County, Quebec, about 12 miles north of Montmorency Falls, the last week in August, 1930.

The bird is all pale lemon yellow (Martius to Picric Yellow of Ridgway's 'Nomenclature'), whitening to throat, except for a saddle of normal dark olive across the shoulders extending from up the back of the neck to near rump. It is identical in general effect with many pied yellow and green domestic canaries and such for more than a moment it was taken to be. So close is this resemblance that even when the distinctly Flycatcher bill was observed the suggestion of a cleverly constructed hoax was almost unavoidable and it was not until the wing and tail formulae, the rictal bristles and the feet characters were closely examined that the suspicion could be completely dismissed.

The explanation of this peculiar coloration seems to be that the specimen is an albino in only one color factor. The normal coloration of the

[1] 'The Auk,' Jan., 1931, p. 120.

species is of course in shades of dull olive. Undoubtedly this olive is composed of an intimate mixture of brownish and yellow pigments. In this case the brownish or dark element is entirely absent over large areas of the plumage leaving the yellow unaffected and showing in its purity. I have seen at least one other similar albino,—a Leucosticte in an old collection of mounted birds in Banff, Alberta. In this case while it was also the brownish element that was lacking it was a red element of the normal mixture that remained producing a beautifully pale rose tinted bird.—P. A. TAVERNER, *National Museum of Canada, Ottawa.*

Magpie Breeding in Captivity.—In the National Zoological Park, the American Magpies (*Pica pica hudsonia*) are rearing young. This is probably the first breeding record of the bird in Washington, D. C., the activity taking place in captivity. The Magpie is a characteristic bird of the West and Northwest and occasionally stragglers are found as far east as Illinois. The bird student of the east does not have the opportunity to observe the Magpie, hence the interest in this much scolded bird of the west.

Both birds took part in the construction of the nest, and as completed it stands eight feet from the ground, being about one foot wide and deep. The interior is the shape of a cup, cemented with mud, and is about six inches wide and deep. The material is sticks, put into the cage for building purpose. The top of the nest is open, and not arched over as is the nest in nature. However, the size of the nest has no significance for nesting material was limited.

Six eggs were laid, and in seventeen days, four of them hatched into small, naked, blind, brown youngsters. The remaining two proved infertile. The female appeared to do all the incubating, and remains constantly in the nest with her family. The male stays nearby and brings food to them.

When the nest is approached both birds scold in the typical Jay manner. —MALCOLM DAVIS, *Nat. Zoological Park, Washington, D. C.*

The American Magpie (Pica pica hudsonia) at Point Lookout, Maryland.—On the morning of June 28, 1931, about a mile from the point, while driving along the main road, the writers saw a large black and white bird in company with some Crows, being pursued by a Kingbird. Upon closer inspection the bird proved to be a Magpie, the long, narrow black and white wings and the very long, thin tail making the identification quite simple. The presence of the Crows was a good check on its length.

This bird was not seen or heard of again. Whether or not it was a bona fide straggler or merely an escape is a matter of conjecture. Court has had experience with this species in the middle west and the caged birds in the local zoo were closely examined, so there seems no room for doubting the identification.—W. HOWARD BALL AND EDWARD J. COURT, *Washington, D. C.*

Notes on the Starling (Sturnus vulgaris) in the Northern Parts of its North American Range.—Mr. W. J. Brown, of Montreal, observed a pair of Starlings nesting at Metis, Matane County, Quebec, on the south shore of the St. Lawrence estuary, in the early summer of 1929. The nest was built in a deserted Flicker's hole in a birch tree and contained large young when examined by Mr. Brown on June 15, 1929. The residents of the farm on which this nest was situated informed Mr. Brown that this pair of Starlings had spent the winter of 1928–1929 about their farm buildings at Metis. Mr. Brown observed a pair of Starlings nesting in the same cavity in the spring of 1930.

At Trois Pistoles, Temiscouata County, Quebec, which is also on the south shore of the St. Lawrence estuary, but is about 62 miles southwest of Metis, I found Starlings scattered rather commonly through the village on January 9, 1931. Altogether about 20 individuals were seen, although all of the village was not visited. There was deep snow on the ground at the time and the weather was fine and moderately cold.

The Starlings were eating the fruits of the mountain ash (*Sorbus americana* Marsh.), which had apparently been abundant on ornamental trees in the village in the autumn, but were becoming scarce at the time of my observations. I was told that much of the local crop of these fruits had been eaten by Pine Grosbeaks (*Pinicola enucleator leucura*), but I saw none of these birds. Competitors with the Starlings for the fruits at the time of my visit to Trois Pistiles were Bohemian Waxwings (*Bombycilla garrula*), a small flock of which was present. Both Starlings and Waxwings, sometimes separately, but often in close company, were seen eating chiefly fruits that had fallen on the surface of the snow as a result of earlier feasts in the branches above, for very few fruits remained on the trees. Although the two species of birds were thus in direct and rather keen competition for winter food, neither one was seen to interfere directly with the other.

On April 18, 1931, I saw a pair of Starlings at Bic, Rimouski County, Quebec, between Trois Pistoles and Metis and about 28 miles northeast of the former.

On making further inquiries concerning a report that Mr. P. A. Taverner had received and had kindly transmitted to me, I have been informed by Major L. S. Dear, of Port Arthur, Ontario, on the north shore of Lake Superior, that there are several credible reports of Starlings in that vicinity and that at least one specimen has been obtained and preserved. A resident of Port Arthur who had been familiar with the Starling in England informed Major Dear that a pair of Starlings tried to nest in a hole in his frame house at Port Arthur in the summer of 1930, but gave up the attempt after a few days, as the hole was too small for them.

Rev. A. Greaves, of Murillo, Ontario, about ten miles west of Port Arthur, published in the 'Times-Journal,' a newspaper of Fort William, Ontario, near Port Arthur, on January 22, 1931, a statement that he had seen two Starlings in Fort William on the previous day. He had been

familiar with the Starling in England. Mr. Greaves later informed Major Dear that he had seen three Starlings at his residence at Murillo on April 6, 1931.

From Mr. T. W. Love, of Fort William, Major Dear learned that a Starling had been picked up dead in one of the city parks of Fort William on or about February 1, 1931, and that it had been mounted and was preserved at the Heath Street School, Fort William. On May 14, 1931, Major Dear examined this specimen and verified its identification as *Sturnus vulgaris*.

Port Arthur and Fort William are in latitude 48° 27′ N., Trois Pistoles is in latitude 48° 8′ N., and Metis is in latitude 48° 38′ N.

As a summer resident the Starling is now abundant at Ottawa, Ontario, and common at Quebec, Quebec. It winters in both of these cities in reduced numbers.—HARRISON F. LEWIS, *National Parks, Ottawa, Canada.*

Western Meadowlark at Battle Creek, Michigan.—On May 28, 1931 I visited the farm of A. H. Gorsline east of Battle Creek, where during the past few years, the Dickcissel (*Spiza americana*) has been found. I was hoping to find that this bird had returned. As I stopped the car beside the alfalfa field a clear bell-like voice attracted my attention. The voice resembled that of the Baltimore Oriole but was louder and more bell like, resembling also the song of the Wood Thrush. The bird proved to be a Western Meadowlark (*Sturnella n. neglecta*).

The following day Mrs. Alfred Steinel, who spent most of her early life in the middle west and knew the bird in that location, visited the field and identified it at once. We visited the location again on June 2 and found the male bird singing in the same field. However, shortly after this the alfalfa was cut and the Meadowlark disappeared.—LAWRENCE H. WALKINSHAW, *Battle Creek, Mich.*

Orchard Oriole in the Adirondacks.—The writer observed, on July 8, 1927, an Orchard Oriole feeding a young bird at the Owaisa Club, Wilmington, N. Y. Since this locality—only a short distance from Whiteface Mountain—is near, or at, the northern extremity of the range of the bird as recorded in Eaton's Birds of New York, the instance is probably worth reporting.—WILLIAM VOGT, *Hastings-on-Hudson, N. Y.*

Icterus pustulatus, a New Bird to the A. O. U. Check-List.—On May 1, 1931, a male Scarlet-headed Oriole (*Icterus pustulatus*), in first year plumage, was collected at Murray Dam, near La Mesa, San Diego County, California, by Frank F. Gander, a member of the staff of the San Diego Natural History Museum.

The capture of this specimen constitutes the first record within the United States boundary and adds another semi-tropical wanderer to the A. O. U. 'Check-List.' The normal range of the species is western and southern Mexico, north as far as Tecoripa, Sonora (van Rossem, Trans. San Diego Soc. Nat. Hist., Vol. VI, No. 19, p. 389, 1931).

Questioning the collector regarding the capture of this unusual migrant, the writer was informed that the bird was uttering notes not unlike those of *Icterus bullocki bullocki*, which it was believed to be, and that its position in the sycamore tree and manner of perching were typical of that Oriole.

The writer is indebted to H. S. Swarth, of the California Academy of Sciences, for positive identification. The specimen is now No. 14521, collection of the San Diego Society of Natural History.—LAURENCE M. HUEY, *San Diego Society of Natural History, San Diego, California.*

Nesting of a pair of Red-winged Blackbirds on a Hilltop.—Red-winged Blackbirds usually nest in bushes or reeds near water, very often over it in swamps. A nest of this bird at a distance of "fully half a mile from open water," and in a wild cherry tree twenty-one feet from the ground, is a curious exception recorded by I. E. Hess (Osprey, 1897, vol. 7, p. 13). H. Nehring (Bull. Nuttall Ornithological Club, 1882, vol. 7, p. 166) recorded a nest "in a blackberry bush on the edge of a thicket; there was no swamp within a mile." In May, 1931, a nest of the Red-winged Blackbird was built near my house at Ipswich in a raspberry bush on a dry glacial hilltop, sixty feet above the level of the salt marsh, some two hundred yards away.

My feeding station at the house had been visited by a male Red-winged Blackbird from the first of May, and, by the 14th, two males frequented it, usually picking up seeds that had been dropped from the table, but later alighting to feed on the table itself. Soon after this the female appeared, the nest was built, but, in the stormy weather, only one egg hatched and the young successfully reared. Several other pairs nested as usual in bushes close to the salt marsh.

It is a natural inference that the abundance of food at the feeding station induced the birds to nest in this unusual place, the male, which alone had fed there, choosing the nesting territory. A similar instance is reported by H. B. Bailey (Bulletin Nuttall Ornithological Club, 1876, vol. 1, p. 25) where a pair at Cobb's Island, Va., "raised a brood in a grapevine arbor near the house and picked up crumbs from the piazza."—CHARLES W. TOWNSEND, *Ipswich, Mass.*

On the Color of the Iris and other characteristics of the Boat-tailed Grackle.—I have read Mr. Sprunt's most pertinent article on *Megaquiscalus* in 'The Auk' for July 1931 and also Major Brooks' article in 'The Auk' for October 1928. I am wondering if the latter's remarks, wherein he compares the two forms of these Grackles with the idea they should be considered full species, have been based on observations taken at similar seasons of the year. That is to say were *M. m. major* and *M. m. macrourus* in mating condition when observed? During the midwinter season and usually until late February the old males of *M. m. major* are frequently, not always, in flocks of greatly varying size *separate* from the flocks of females and *immature* males as my notes show.

Compare C. J. Maynard in 'The Birds of Eastern North America,' pp. 152–153, wherein he states: "Throughout the winter these Blackbirds assemble in large flocks, some of which are wholly made up of males while others are composed mainly of females, but by the first of March these large assemblies break up into smaller companies and both sexes come together."

Mr. Maynard also states that the iris of the adult male is "reddish brown" and of the female "iris, as in the male."

Certainly an intimate acquaintance with the adult male of this form will show that it has yellow or yellowish irides.

In Nuttall's 'Manual of the Ornithology of the United States and Canada,' we find "tail wedge-shaped and like that of the common species is capable of assuming a boat-shaped appearance. Iris pale yellow. . . . The young at first resemble the female but have the iris brown and gradually acquire their appropriate plumage." In Audubon's 'Ornithological Biography' vol. II, 1834, p. 509 he states: " . . . tail very long, graduated, broadly rounded at the end. . . . Iris pale yellow." Of the female he says " . . . the tail is graduated as in the male but much shorter . . . " and gives no reference to the color of the iris of the female. In Baird, Brewer and Ridgway's 'A History of North American Birds,' Vol. II, 1874, pp. 222–223 the following occurs: "Sp. char. . . . . tail long, graduated . . . , adult male, ... Iris yellow. . . . " No reference to the color of the irides of females. In this same volume, p. 224, it is stated that with the commencement of incubation the males "desert their mates and joining one another in flocks keep apart from the females, feeding by themselves until they are joined by the young broods and their mothers in the fall," which is quite at variance with my observations as stated above and confirmed by Mr. C. J. Maynard (*antea*). Quoting from my notes from Charlotte County, Florida, 75 to 100 miles down the Gulf coast from Tampa:

January 15, 1922. Thirty or more males together at the Glover place. On this lawn are many palms and other exotics and later these birds nest there.

January 23, 1922. Shot four from a bunch of fifteen or more. These and all I could recognize were males.

February 23, 1922. Males are getting very noisy.

March 4, 1922. Eleven females in one group feeding in the street.

March 5, 1922. Four males, no females, on mud-flats, but some flocks now are of mixed sexes.

January 11, 1923. Thirty or more flying, mixed sexes.

February 6, 1925. Eleven, all males, feeding along ditch.

March 9, 1926. Shot four from flock of fifty or more . . . . all males and all of the flock appeared to be males; none in bright mature plumage. I have noted them already building elsewhere in Punta Gorda, am wondering if they do not mate until in second year. These four were in molt.

January 11, 1925. Thirty or more flying. Mixed sexes.

March 27, 1926. A male skinned today was not in bright plumage and testes not enlarged. Some have eggs now.

March 7, 1926. A female gathering and carrying food, must have young in nest.

April 4, 1925. Shot four from a bunch of about twenty, all males.

Other notes from the same source confirm the fact that the older males consort after the nesting season has ended but I have never noted a mated male other than in high brilliant plumage and while I cannot state positively that the less brilliant males do not mate such would seem to be the case.

During the school term, in Punta Gorda, Charlotte County, Florida, these birds frequent the playgrounds and drop down from nearby trees to obtain discarded pickings from lunches while the children may be close about, and throughout the little city flocks of these birds are a common sight on vacant lots and along the grassplots adjacent to sidewalks and street ways. They nest throughout the city usually in trees of dense foliage, mangos and palms preferably, and commence their building activities in March. On April 1, 1926 I took three fresh eggs from a nest in a mango tree which grew by the sidewalk in a much built-up part of the city. One cannot argue a point without full data on both sides but as I have observed *M. m. major*, in Florida, the adult male has the irides yellowish; while in the immature males and females they are brown. It would therefore seem to me possible that Major Brooks and earlier writers may, in part at least, have made their observations on females and immature males, which have brown or brownish irides. I would also emphasize the fact that the bird, in country, village and city, is abundant, confiding and garrulous to an extreme degree.

The behavior of *M. m. major*, in mating and nesting seasons is so different from its actions and vocal performances at other times that one must see it from March to July to learn its most interesting characteristics. Observe a glistening old male atop a buttonbush, in a saw-grass marsh, his seraglio close under his view and let a rival or almost any unusual intruder appear and his protests are sent forth in no unmistakable terms, mostly in high, strident notes but varying greatly in pitch and volume.—C. J. Pennock, *Kennett Square, Chester Co., Pa.*

On the Color of the Iris in the Boat-tailed Grackle.—Mr. Sprunt in the July, 1931, Auk, pp. 431–432, states that the iris of the Boat-tailed Grackle (*Megaquiscalus major major*) is always yellow in which he differs with Major Brooks (Auk, 1928, vol. 45, pp. 506, 507) who states that the iris is always dark brown. Each ends his note with an appeal for the observations of others.

In February, 1926, I studied the Boat-tailed Grackle in Florida, often near at hand, and noted at Punta Gorda on February 8, and again on February 11, that the irides of the males were "dark brown, not white."

In April, I studied this species in and near Charleston, South Carolina, and was surprised to find the irides white or yellowish white, like those of the Great-tailed Grackles (*M. major macrourus*) I had seen in Texas. Is it not possible that there is a change of color of the iris in the Boat-tailed Grackle with the season? The birds were beginning to court in February but not so actively as later.

Incidentally I might remark that I have found that in both species the tail is carried boat- or V-shaped during the courtship season and the autumnal recrudescence, but at other times it is generally flat as in most other birds. I noted on Feb. 11 that the tail of *major* was not V-shaped or only slightly so. Major Brooks, however, limits the "folded" tail to *macrourus*. I agree with him, however, that the Boat-tailed and the Great-tailed Grackles are probably specifically, not merely subspecifically, distinct, although I arrived at this conclusion in a different manner, for I found the voice and courtship in the two birds so entirely different (Auk, 1927, vol. 44, pp. 551–554) a paper that Major Brooks evidently overlooked.—Charles W. Townsend, *Ipswich, Mass.*

Lapland Longspur at Brigantine, N. J.—On December 26, 1930, T. G. Appel, C. L. Fasnacht and myself saw a flock of twelve Lapland Longspurs (*Calcarius lapponicus lapponicus*) on Brigantine Island, N. J. They were in company with about twenty-five Horned Larks. The Longspurs and Larks did not intermingle—instead, each species kept to itself and the two flocks traveled together.

We discovered these Longspurs immediately in front of the Country Club building on the Island. A search for them the next day failed to give us another view.

Mr. Forbush, in 'Birds of Massachusetts' says of this bird "On migration in the United States, this bird keeps in the interior for the most part, between the Alleghanies and the Rockies, and is rarely seen on the Atlantic seaboard of the middle and southern Atlantic Coast States."—W. Stuart Cramer, *44 E. Orange St., Lancaster, Pa.*

Some Nesting Records from the Vicinity of Washington, D. C.—Vesper Sparrow (*Pooecetes gramineus gramineus*): May 30, 1931, nest with three eggs; June 7, nest with three eggs; both nests from the same locality, near the summit of a bare hill on the eastern side of Paint Branch. Grasshopper Sparrow (*Ammodramus savannarum australis*): June 7, 1931, nest with five eggs; in the locality just given for the nests of the Vesper Sparrow, but at a slightly lower elevation. Eastern Henslow's Sparrow (*Passerherbulus henslowi susurrans*): June 7, 1931, nest with five eggs; in the normally wet, but this year very dry, meadows two miles west of the Cabin John bridge.—Herbert Friedmann and Austin H. Clark, *U. S. National Museum, Washington, D. C.*

Ammospiza caudacuta diversa (Bishop) a Valid Race.—A recent study of the Sharp-tailed Sparrows of the Atlantic coast of the United

States has brought to light the interesting fact that there exists in this region an unrecognized subspecies which is readily distinguishable from the typical Sharp-tailed Sparrow (*Ammospiza caudacuta caudacuta*) of southern New England. This bird was many years ago described by Dr. Louis B. Bishop as *Ammodramus caudacutus diversus* ('The Auk,' XVIII, No. 3, July, 1901, page 269), type from Wanchese, Roanoke Island, North Carolina. It differs from typical *Ammospiza caudacuta caudacuta* in its darker, more rufescent upper parts, the colors of which are more contrasted, the blackish areas more intense, and the superciliary stripe more richly rufescent. In size it is practically the same, as the measurements given by Dr. Bishop (loc. cit.) show. It is separable from *Ammospiza caudacuta nelsoni* by decidedly larger size; duller, less rufescent upper parts, the colors of which are less contrasted; and in much more heavily and sharply streaked jugulum and sides of body.

This is the breeding race of the Atlantic coast marshes from North Carolina, north to Maryland, beyond which it is represented by *Ammospiza caudacuta caudacuta*. It winters from North Carolina to Florida, as far west as Goose Creek and Tarpon Springs, and as far south as Cape Sable.—HARRY C. OBERHOLSER, *Washington, D. C.*

Junco annectens Baird, in Utah.—June 27, 1930 in the upper part of Dry Cañon, a few miles east of Logan, Utah, I took two Juncos as they moved excitedly about among the brush. A search was made for a nest but in vain. Skins were made of the adults, male and female, and the male was sent to Washington, D. C., for identification. Dr. Oberholser identified it as *Junco annectens*.

This is a new record for Utah.—J. S. STANFORD, *U. S. A. C., Logan, Utah.*

A Seventeenth Century Representation of the Cardinal.—In reference to the note under this head in the January 'Auk,' p. 127, it may interest American readers to know that in the Seventeenth Century the keeping of exotic birds in aviaries, which were sometimes heated, serving at the same time as hot houses for tropical plants, was a much pursued hobby of the wealthy Dutch merchants, share-holders of both the East Indian and West Indian Companies, which were of the kind afterwards called "Chartered Companies" being invested by letters-patent with political powers too. These merchants ordered such birds from the territories the companies held in different parts of the world, which explains the occurrence on the canvas alluded to of such divergent species. It is well known that formerly part of the present United States of America was a Dutch colony with Nieuw-Amsterdam (now New York) as its principal settlement.

Melchior d'Hondecoeter was a rather famous member of a family of painters, his specialty being birds (as his father Gysbert's was barn-door fowl), which even procured the first named the rather pompous surname of "Raphael of the Animals." A research of his paintings in the museums in Holland might reveal more such early representations of American

birds. I am pretty sure of Hummingbirds.—J. OLIVIER, *Passarstraat 149, Meester Cornelis, Dutch East Indies.*

On the Status of Chlorospingus olivaceus (Bonaparte).—While studying material necessary for a detailed revision of certain members of the genus *Chlorospingus*, Dr. C. E. Hellmayr very kindly offered to examine the type of *C. olivaceus* (*Poospiza olivacea* Bonaparte) which is in the Museum d'Histoire Naturelle, in Paris. I have received the results of this examination from Dr. Hellmayr who says: "In spite of its immaturity, there is no doubt that this bird *does not belong* to the east Guatemalan race, to which the name *olivaceus* has universally applied. I take it for a young *ophthalmicus*." Dr. Hellmayr also tells me that there is small likelihood of the type having come from Guatemala, as was assumed by Sclater (P. Z. S. Lond., XXIV, p. 91. 1856). Obviously it did not come from "Brasil," as was stated by the describer! In the above mentioned revision, shortly to be published, during which some four hundred specimens referable to thirteen forms were critically examined, it appears that the bird now known as *C. olivaceus* is but subspecifically distinct from *C. ophthalmicus* of Vera Cruz. As the former is in need of a name, it may be called

Chlorospingus ophthalmicus dwighti nom. nov.

Subspecific characters: Distinguished from *C. o. ophthalmicus* by decidedly grayish pileum, bordered laterally by a blackish stripe; slightly darker (less greenish) back, and more grayish middle of the abdomen. The yellowish pectoral band is just as pale and narrow as in the typical race.

Type: American Museum of Natural History, No. 294658; ad. ♂; Finca Sepur, Vera Paz, Guatemala; January 4, 1926; A. W. Anthony.

Range: Subtropical Zone of the Atlantic slope of Chiapas, Mexico, and eastern Guatemala.

I take pleasure in naming this bird after the late Dr. Jonathan Dwight, to whom so much of our recent knowledge of Guatemalan birds is due. I am indebted to Drs. Hellmayr and Chapman for assistance.—C. ELIOT UNDERDOWN, *Field Museum of Natural History, Chicago.*

Prothonotary Warbler Breeding in West-central Michigan.—On June 21, 1931, when on a trip with two other members of the staff of Field Museum, a Prothonotary Warbler was heard singing. The locality, below Hesperia along the White River in Oceana County, Michigan, seems to be the most northerly point where the bird has been found breeding in the state. Kalamazoo is the nearest published locality, and is over a hundred miles to the southeast. Mr. Gordon Pearsall discovered the nest after a few minutes' search. Both parents were observed, the male carrying caterpillars to the four young. Mr. Frank Letl took a photograph of the site, which was a rotted hollow in a large horizontal limb of a fallen tree, but owing to the very bad light was not able to secure a picture of the actual

nest with the young. On an eleven mile stretch below Hesperia, at least a dozen pairs were seen and heard.—C. ELIOT UNDERDOWN, *Field Museum of Natural History, Chicago, Ill.*

Brewster's Warbler in Calhoun County, Michigan.—While searching for nests of the closely related *Vermivora, pinus* and *chrysoptera*, I was surprised, when I examined a singing male through my binoculars, to see that it was a Brewster's Warbler (*Vermivora leucobronchialis*). The song was of the Golden-winged Warbler type in that it was zwee-zwee-zwe-zwe. The coloration was like that of the Golden-winged Warbler except that there were no chin or face markings, only the black eye-line as in the Blue-winged Warbler. The top of the head and the wing bars were yellow, I did not note any yellow on the breast.

Two days later, June 13, 1931 I returned with friends and we found this same bird. We also found on the same brush covered hillside a male Golden-winged Warbler and a duller colored Brewster's Warbler both scolding us from the same bush. A search for nests was fruitless.

On June 21, Miss Clara Cartland and I returned to the same area, locating the male Brewster's but were unable to locate any nest, while one week later H. A. Olsen and I had difficulty in locating the bird. He was singing very little. Blue-wings and Golden-wings were present on all of these trips.—LAWRENCE H. WALKINSHAW, *Battle Creek, Mich.*

Chestnut-sided Warbler Breeding in Montgomery County, Pa.—On June 7, 1931 while exploring a tract of thorn bushes and second growth about one-half mile north of Laverock, Pennsylvania, I saw and heard a male Chestnut-sided Warbler. I continued to hear this bird on daily trips thereafter, and was convinced that he must be nesting in the vicinity. The female was not seen during this period nor could the male be discovered taking any part in the construction of a nest.

On June 15, I discovered a practically completed nest about two feet from the ground, well concealed by the leaves of the low bush and entwining vine in which it was built. The bush was on the side of a dried-up stream bed and was well protected by second growth on all sides. This nest was completely built, cup-shaped, lined with rootlets and covered on the outside with milk-weed. Although neither male nor female Chestnut-sided Warbler was visible, I judged this to be their nest and accordingly did not visit the spot again for several days. My next visit was five days later, June 20, I was disappointed not to find any eggs, but had the good luck to see both birds near the nest, scolding violently. This visit identified the nest almost certainly as a Chestnut-sided Warbler's, but it caused another disappointment, as visits on June 24 and June 29 proved that the nest had been deserted. The male was heard singing on both occasions, but much searching failed to disclose the site of any second nest.

I was unable to visit the location again until July 13, when I at once heard the male singing and soon discovered him gathering grubs at a spot

about 125 feet from the first nest. This time a short search revealed a second nest, almost identical with the first in structure and in position, again about two feet up in the crotch of a low bush; milk-weed had again been employed for the outer covering. The second nest had evidently just been vacated, as it was considerably beaten down at the rim and crawling with parasites. I observed the male twice quite close to this nest gathering grubs and caterpillars, but was unable to trace the female or the young.

While the results of this investigation were not wholly satisfactory, I had the pleasure of collecting both nests and later of comparing them with a nest of the Chestnut-sided Warbler in the collection of Mr. William H. Trotter, which they closely resembled. Other birds discovered nesting in this immediate vicinity were Brown Thrasher, Cardinal, Catbird, Song-sparrow, Field Sparrow, Yellow-breasted Chat and Maryland Yellow-throat. No birds were seen whose nest could possibly be mistaken for that of the Chestnut-sided Warbler, and in addition I observed the male Warbler almost continuously from June 7 to July 13. I feel that this is conclusive evidence that the Chestnut-sided Warbler is extending its range, as I understand that breeding records of this bird in Montgomery County have been extremely rare.—CHARLES PLATT, *Laverock, Chestnut Hill, Pa.*

Palm Warbler Breeding in Michigan.—A small group of observers from southern Michigan spent several days on the Jack Pine plains in Crawford County. At Lovells, on June 16, 1931 Mr. N. T. Peterson noticed a Palm Warbler (*Dendroica palmarum palmarum*) which was scolding. He attracted our attention and we were soon able to locate three young which could not have been out of the nest more than one day. They were easily captured, then banded and photographed. The following day a male Palm Warbler was heard to sing from the top of a jack pine tree.—RICHARD E. OLSEN, HUMPHREY A. OLSEN AND LAWRENCE H. WALKINSHAW, *Battle Creek, Michigan.*

Prairie Marsh Wren Wintering near Madison, Wisconsin.—The Prairie Marsh Wren (*Telmatodytes palustris iliacus*) arrives at Madison in spring on the average date of April 27. The earliest acceptable date of arrival is March 25 (1928). A bird found near a spring at Lake Wingra on March 5, 1922, induced the belief that this Wren occasionally winters. Search in winter of likely localities was fruitless until Dec. 31, 1928, when I worked the Mud Lake region. Here I found three birds in the dense beds of cat-tails bordering the open water of the Yahara River and at the "spring holes" in the marsh. I was unable to secure a specimen as the Wrens moved for the most part under cover of the rushes, only a fleeting glimpse being obtainable. The breeding bird is *T. p. iliacus* but the possibility remained that *T. p. palustris* might occur sparingly and winter. On Jan. 3, 1931, I took a specimen in the same locality. Subsequently, through the kindness of A. H. Howell, I was able to compare it with specimens of *T. p. iliacus*, in winter plumage, in the U. S. National Museum.

The 1910 Check-List, and local and state lists of the north central states are devoid of information on the wintering range in the Mississippi valley. —A. W. Schorger, *168 North Prospect Avenue, Madison, Wisconsin.*

Some Unusual Bird Notes from Cheshire County, New Hampshire.—*Somateria molissima dresseri.* Eider.—Just below Cobb's Island where Mill Brook empties into the Connecticut River in Westmoreland, on April 19, 1931, I had occasion with three companions to watch two male and six female Eider Ducks feeding. We were using 8x binoculars and were at the water's edge. The birds when first seen were drifting downstream close to the New Hampshire bank and later worked up-river close to the Vermont shore. Occasionally one dove and came up a distance ahead of the others. Their presence on this body of fresh water seems noteworthy to both New Hampshire and Vermont birdmen.

Querquedula discors. Blue-winged Teal.—Some few minutes had elapsed when two Teal were discovered overhead just as they checked their hurried flight and were turning about-face. They gave two separate three-syllabled "quacks" thereby frightening the Eiders, and all disappeared beyond the island. In the January 'Auk,' 1931, pp. 110–111, J. J. Murray speaks of the vocal notes of this species. I also found it noisy in migration, both at this time and on other occasions. On May 2, some two hundred yards below Cobb's Island, I flushed a male and female along the bank and not over twenty feet from me, and the same loud "quacking" note was given. In both cases the birds had become suddenly frightened, and at neither time could the sex of the vocal bird be determined. Teal breed along this watercourse in locations about the two islands, but the species is undetermined.

Mareca americana. Baldpate.—When the two Teal flushed from the river bank on May 2, four Baldpates, frightened no doubt by the Teal's calls, suddenly appeared winging out of a sheltered cove. They passed close inshore, saw me and wheeled out over the water, going downstream in rather unhurried flight. The white crown, black lower tail-coverts against the white belly when they banked in passing me, and the white patch on the forewing were clearly noted. A hunter with me on this and the occasion of seeing the Eiders remarked that he had never seen either kind on the river before.

Passerculus princeps. Ipswich Sparrow.—Since, according to the third volume of Mr. Forbush's 'Birds of Massachusetts and Other New England States,' the distribution of this Sparrow is given as "rare local migrant coastwise," the occurrence of a stray in the Connecticut River valley is of interest. On April 20, and until May 2, 1931, I found an individual of this species in a large mowing on the flats along the river and in the adjoining towns of Walpole and Westmoreland. The bird would flush once and then was hard to put up. It uttered a song,—which seemed to me exactly as recorded by Jonathan Dwight: "*tsip-tsip-t's-e-e-e-e-pr-re-e-ah,*" and could be approached closely as it tried to hide in the grass or crouched conspicuously in the open.

Dendroica p. palmarum. PALM WARBLER.—On April 14, 1931, while anxiously searching through a flock of Juncos for some of unusual markings, a Palm Warbler flew up from the ground into an alder beside me and gave a few excited *chips* before it flitted away. I had an excellent view of it and, being well acquainted with *D. p. hypochrysea*, knew it at once to be *palmarum*. Later I relocated the bird and studied it at leisure. According to Forbush there is "one doubtful report from New Hampshire" in spring.—LEWIS O. SHELLEY, *East Westmoreland, N. H.*

Bird Life on Brasstown Bald, Georgia.—The Southern Appalachians in northern Georgia are in the upper Austral and Transition Zones, the highest peak, known as Brasstown Bald being about 4768 feet above sea level and lying on the Union and Towns County lines. As this section as well as this particular mountain have been well studied by Mr. Arthur H. Howell and a report made on the bird life during the summer of 1908, it has long been my ambition to follow this up and see what forms now occupy Georgia's highest mountain top. So on May 30, 1931, Norman Giles, Jr., Nelson Spratt, Jr., Don Eyles and I motored to Young Harris and over to the foot of the mountain, left the car there and after losing the trail and having a rough journey arrived at the summit, where we spent the night around a campfire. About ten the next morning we broke camp, followed a good trail down, and drove back to Atlanta. Although our stay was a short one, the species we saw and heard made the trip well worth while and I am convinced that more time and study would have produced some very valuable results. I will mention only the rarer forms for this state—*Corvus corax europhilus*—the Southeastern Raven we found rather common around the summit, a number of birds seen and heard, about five together at one time. *Junco hyemalis carolinensis*—the Carolina Junco we found fairly common on top and they were undoubtedly nesting although we failed to locate a nest. *Zamelodia ludoviciana*—the Rose-breasted Grosbeak, a male in full song and a female later on when we were coming down the mountain. *Piranga erythromelas*—Scarlet Tanager—several males and one female noted. *Lanivireo solitarius alticola*—Mountain Solitary Vireo—two of these birds were seen and heard, the song being somewhat like that of the Yellow-throated Vireo. *Dendroica caerulescens cairnsi*—Cairns' Warblers were rather common. The Blackburnian, Black-throated Green, and Canadian Warblers were noted by other members of the party. The Oven-bird (*Seiurus aurocapillus*) was the most abundant of this family, many seen and others heard. One of our greatest discoveries was the nest of the Chestnut-sided Warbler (*Dendroica pensylvanica*), just completed, no eggs, and the adult birds right by it. The Veery or Wilson's Thrush (*Hylocichla fuscescens*) was heard singing on both days and undoubtedly breeds about the top of the Bald.—EARLE R. GREENE, *Atlanta, Ga.*

Rare Birds from Keweenaw County, Michigan.—Dr. S. Kneeland, Jr., resided on this point from August, 1856 to June 1857, and published a list of 147 species (Proceedings of the Boston Society of Natural His-

tory, Vol. VI, 1856–1859, pp. 231–242). Of two species in his list we have no specimens from the state. One is the American Magpie (*Pica pica hudsonia*) of which he says: "I have seen a few specimens obtained near Eagle River." In Dr. Sager's manuscript list of birds collected on the State Natural History Survey, 1837–1838, I find "No. 67. *Pica hudsonica.* Magpie. S. E. Michigan. Dr. Sager." And in the old museum collection there is a mounted Magpie marked "Michigan." Of the White Ptarmigan, "*Lagopus mutus* Leach," he says, "There is a white grouse in this region, but whether it is the *L. mutus albus* or *leucurus* I cannot positively say."

H. R. Schoolcraft in 1834 records "the white partridge, *Tetrao albus*," as occurring in the Upper Peninsula. In his work on Lake Superior, 1850, Louis Agassiz says, p. 61, "The magpie of these regions, bye the bye, is no magpie at all, but a jay (*Garrulus Canadensis*) 'the moose-bird,' a confusion that might lead to error as to the range of the American magpie."

In 1931 the writer studied the spring migration of the Point from Apri 22 to June 14, with headquarters at Copper Harbor, 35 miles northeast of Calumet. One hundred and fourteen species were observed and one hundred and thirty specimens taken. An adult Holboell's Grebe (*Colymbus g. holboelli*) was found, April 22, on the road near Copper Harbor, and was captured after a short chase. This was the only one seen. In Michigan it is only common near Beaver Island, Charlevoix County, where many are taken in the nets of the fishermen. In 1929, from May 2 to 14, seventy-five adult Grebes were brought into St. James.

On May 1, an immature male Swainson's Hawk (*Buteo swainsoni*) was taken on Manitou Island at the east end of Keweenaw Point. This is the third specimen for the state. The first was also collected October, 1883, in Cheboygan County, by the writer.

The first Lark Sparrow (*Chondestes g. grammacus*) taken in the Upper Peninsula was collected by the writer on May 28 at Copper Harbor; no others were seen. An adult female Harris's Sparrow (*Zonotrichia querula*) was also taken at Copper Harbor on May 20. This is the seventh Michigan specimen. The first one was taken in Marquette County, September 30, 1894; the second, at Battle Creek in October, 1894; the third at the Soo on February 22, 1900; the fourth, September 26, and the fifth, October 3, both 1919 at Huron Mountains, Marquette County; the sixth was taken at the Soo by M. J. Magee, September 26, 1926.

Gambel's Sparrow (*Zonotrichia l. gambeli*) was not mentioned by Barrows in his 'Michigan Bird Life,' 1912, and it was first taken by the writer in Berrien County, May 8 and 13, 1918. M. J. Magee banded one at the Soo in May, 1925, and captured another May 16, 1928, which he sent to the Museum of Zoology. In 1931, at Copper Harbor, the writer collected one on May 16, one May 18, and one May 23. Several others were seen on those dates, so no doubt it is not rare in migration. None were seen after May 23.

Yellow Rail (*Coturniculus noveboracensis*). This rare Michigan species was taken by the writer at Copper Harbor, June 9, 1931, and it seems to be

the first record for the Upper Peninsula. It was an adult male in fine plumage.—Norman A. Wood, *Museum of Zoology, Univ. of Mich., Ann Arbor, Mich.*

Some Additional Notes from Michigan.—*Hesperiphona vespertina.* Evening Grosbeak.—June 12, 1931, near McFarland, Marquette County, I discovered a pair of Evening Grosbeaks feeding on aphids in an aspen tree. I collected them and found that they were in full breeding plumage. The bills of both the male and female were light bluish green. After death it changed very rapidly to a darker green. Upon dissection the ovary of the female was found to contain an egg one-fourth inch in diameter. Evidently it was only a matter of a few days before she would have laid. The spot where the birds were found is beside a six hundred acre tract of virgin timber. There are many large white pine trees and evidently it was there the birds intended to nest. The specimens are now numbers 67481 ♂, 67482 ♀ in the Museum of Zoology.

Passerherbulus henslowi henslowi. Henslow's Sparrow.—I found a colony of Henslow's Sparrows a quarter of a mile from the shore of the Straits five miles east of Mackinaw City, June 13, 1931. I collected a male to substantiate the record. It is now number 67483 in the Museum of Zoology. Mackinaw City is located at the farthest north point of the Lower Peninsula so it appears that the Henslow's Sparrow is distributed over the whole lower peninsula. As yet we have no record of its occurrence in the Upper Peninsula.—Leonard W. Wing, *Museum of Zoology, Ann Arbor, Michigan.*

Notes on Hawks and Owls in Sevier Co., Utah.—*Astur atricapillus atricapillus.* Eastern Goshawk.—An adult was taken in November 1928 in a trap set on a high post on the Ivie farm eight miles east of Salina.

Astur atricapillus striatulus. Western Goshawk.—Two immature birds, were also trapped on the post named above on December 4 and January 27.

March 5 I saw a Goshawk beating back and forth over the brush on the Ivie farm. A jack rabbit dashed out and across an adjoining bare field closely followed by the Hawk. They disappeared behind a low ridge. Riding over there I saw two Hawks and the dead rabbit on the snow, one Hawk tearing at the rabbit, the other Hawk a few feet away. As I approached the feeding Hawk flew but the other one quickly ran to the rabbit and began to feed. As I approached nearer it made several vain attempts to carry the rabbit but finally flew and alighted on a bush. The other Hawk had also alighted. While feeding I had recognized it through my binoculars as a Red-tail Hawk. About 30 minutes later I rode again to the kill and again saw two Hawks but this time the Hawk feeding was a Red-tail with much white in its plumage. It soon flew and the waiting Goshawk again resumed its interrupted feast. Again it made a mighty effort to carry off the mangled carcass but in vain. The bird did drag the half-eaten rabbit several feet.

On the mornings of the 6th and 7th I saw a Hawk, no doubt this same Goshawk, feeding on the remnants of the rabbit.

Again on March 17 I fortunately chanced to see a Hawk drop swiftly in the brush where my traps were set for prairie dogs. In a few moments, through my glasses, I could see a Hawk struggling to arise. Riding swiftly to the spot I saw a Goshawk make another mighty effort to arise with a trapped jack rabbit, then it flew away.

I wanted to see that young killer at close range so setting the traps by the rabbit securely fastened to a bush I awaited developments. Next morning seeing a Hawk struggling to arise I soon reached the traps and met the killer at close range. Undaunted by the grip on one leg it seized my boot with a vicious grip of its free foot when I touched it. Finally I took a tail feather for a souvenir and released the Hawk.

Accipiter velox. SHARP-SHINNED HAWK.—October 15 I saw a Hawk, probably this species, carrying a small bird. It alighted on a top limb of a dead tree and stripping off the feathers leisurely ate the bird. November 18 I shot an immature Sharp-shinned Hawk perched high in a Lombardy poplar and on May 17 took an adult female perched in a dead apple tree on the city dump grounds. Ground squirrels (*Citellus m. mollis*) were numerous here.

Accipiter cooperi. COOPER'S HAWK.—Saw one in the valley April 25. It darted out from a clump of bushes and flew swiftly to another clump.

Buteo borealis calurus. WESTERN RED-TAILED HAWK.—These big, soaring Hawks are common about Salina and in the cañons. March 23 shotgun reports boomed at intervals all day. The following day a young resident of the town informed me that eight Red-tails had been shot, some of them in the act of trying to capture chickens. A heavy fall of snow had no doubt driven the Hawks into town to hunt. One can only conjecture how many chickens—and how many rodents—were saved by this slaughter.

Buteo swainsoni. SWAINSON'S HAWK.—At the experiment station about fourteen miles southeast of Salina, I brought to earth a large flying Hawk at dusk on July 26 which proved to be this species. In its crop was a large pocket gopher.

Aquila chrysaetos canadensis. GOLDEN EAGLE.—A pair of these great birds was first seen one snowy day, January 18, on a ledge near the Ivie farm. Occasionally thereafter I saw them in the air until May 31 and always in this same region.

Circus hudsonius. MARSH HAWK.—These birds were common at Redmond Lake, several being seen on every trip there in March and April. Once I saw one swoop toward a small flock of Ducks on the lake scattering them temporarily. One day two birds were seen high in the air above the lake "playing tag." What other term would explain such swoops, climbs, turns, feints, etc.?

Pandion haliaetus carolinensis. OSPREY.—One was seen frequently during our three days at Fish Lake in September. It appeared to have a definite route over which it traveled quite regularly.

Falco sparverius phalaena. DESERT SPARROW HAWK.—Often seen during the spring, summer and autumn in the valley and cañon. During a snowstorm late in May I saw a Sparrow Hawk fly from a tree carrying a small bird and closely pursued by an excited Robin.

Bubo virginianus pallescens. WESTERN HORNED OWL.—December 31 I found a Horned Owl in the trap on the post (on the Ivie farm). I took it to Salina and kept it in a vacant granary for five months. Several frozen Jackrabbits thrown in to it were found decapitated on the following mornings. In March I put in the granary an immature bird also trapped on the same post. A week later I found it torn to pieces.

Sometime during the winter of 1928–29 the No. 0 steel trap disappeared from the post and was replaced by another trap. Early in April, Mr. Ivie found a dead Horned Owl hanging in the No. 0 trap which had caught on a branch of a juniper about one half mile from the post.—J. S. STANFORD, *U. S. A. C., Logan, Utah.*

Notes on two Birds from San Diego County, California.—*Elanus leucurus majusculus.* WHITE-TAILED KITE.—The presence of White-tailed Kites in the most southern coastal county of California has been known to the writer from but a single nesting record—Lakeside, San Diego County, California,[1] March 24 and April 25, 1890. On these two dates the venerable oologist, Albert M. Ingersoll of San Diego, collected 2 and 4 eggs from two nests built and occupied by the same pair of birds. This marks the southernmost breeding station for the species in California and, added to two observations by Anthony (Grinnell's 'A Distributional Summation of the Ornithology of Lower California,' Univ. of Calif. Pub. in Zool., Vol. 32, No. 1, p. 106) from Lower California, at about the same time, completes our meager knowledge of the occurrence of this bird in the southern reaches of its range.

With this brief history of an exceedingly rare bird in mind, the writer was not a little surprised when, on January 15, 1930, a local hunter unrolled from a blood stained newspaper a freshly killed White-tailed Kite. Information gleaned from the man revealed the fact that a pair of these beautiful birds had been coursing about the precincts of a gun club, situated on the brackish waters of the Tia Juana marsh, in southern San Diego County, during most of the winter. Numerous attempts had been made by different members of the club, on shooting days, to kill the Hawks, as they all believed, unfortunately, that "dead hawks are the only good hawks." However, it was not until the above date that either of the pair had come within gun range.

Due, perhaps, to the writer's stressing the bird's rarity and his severe condemnation of its slaughter, the hunter would not part with his kill.

[1] These two sets were erroneously recorded by Willett, "Pacific Coast Avifauna," No. 7, p. 46, as being taken at National City. The writer took occasion to check the facts with Mr. Ingersoll and found that Lakeside should have been stated as the locality where the sets were obtained.

Later, the bird was seized by the local representative of the California State Fish and Game Commission and eventually, after nearly a year in cold storage, found its way into the collection of the San Diego Society of Natural History, where it is now No. 14134.

Upon dissection, the specimen was found to be an adult female with fairly well developed ovaries, the largest of the ova being about three millimeters in diameter. From this evidence it seems reasonable to assume that at least one pair of White-tailed Kites had again attempted to establish themselves in San Diego County and would no doubt have succeeded had they not been prevented through wanton ignorance. The region, according to descriptions of their habitat by other writers, is unusually well adapted as a haunt for this bird, consisting as it does of brackish open marshes, farm lands and river bottoms, bordered with a heavy willow growth.

That still another attempt had been made within recent years by White-tailed Kites to nest in this county was brought to light when the writer was discussing with Mr. Ingersoll the incident recorded above. At this late date it was the writer's pleasure to learn that during the first week of March, 1920, Mr. Ingersoll had discovered a pair of Kites and their newly constructed nest five miles east of Del Mar, San Diego County. The nest was visited again after several days' absence but was found to have been deserted. The close proximity to farms led him to believe that the birds had been shot.

Junco mearnsi. PINK-SIDED JUNCO.—An adult female of this species was collected at Monte Robles, 4 miles southwest of Ramona, San Diego County, on December 18, 1930, by Frank F. Gander. It was taken from a loose flock of about 50 Juncos feeding under several huge live oaks. The specimen is now No. 14117, collection of the San Diego Society of Natural History, making the third recorded instance of this species being collected within the boundaries of the State of California.—LAURENCE M. HUEY, *San Diego Society of Natural History, San Diego, California.*

Unusual Nesting Concentration in a Single Tree.—During the spring of 1931, an instance of remarkable nesting concentration was made known to the writer by Mr. Thomas Rutledge, Jr., of Charleston, S. C. Having occasion to visit the town of Beaufort, some eighty miles south of Charleston, on May 9, Mr. Rutledge noted, in the yard of his hostess, Mrs. J. B. Salley, a pride of India tree which held the homes of five pairs of cavity-nesting birds, representing four species. These were two pairs of Flickers (*Colaptes auratus*); and a pair each of Crested Flycatcher (*Myiarchus crinitus*), Florida Screech Owl (*Megascops asio floridanus*), and Southern Downy Woodpecker (*Dryobates p. pubescens*).

The tree measured but twenty feet in height and forked sharply about ten feet from the ground. Another fork occurred in the right branch a short distance from the main division, and in the left leg of this V were the Flycatcher and Woodpecker, while the right leg held the Owl and one of the Flickers. The other Flicker's hole occupied the left branch of the main

fork. All five cavities were contained in a radius of ten feet, and four were within six feet of each other. All the nests held young birds with the exception of one Flicker, and the eggs therein were on the point of hatching.

This constitutes, by far, the most condensed instance of community nesting of which the writer is aware. One finds such things sometimes in a Heron rookery or among a colony of sea-birds, but for such species as the above it is highly unusual to say the least. All the dwellers of this avian apartmrnt house were living in perfect harmony, and a later trip by Mr. Rutledge showed the young to be progressing satisfactorily in all the nests. —ALEXANDER SPRUNT, JR., *92 South Battery, Charleston, S. C.*

Use of Former Nest Sites.—For thirty-five years a Wood Pewee's (*Myiochanes virens*) nest has been placed in the same fork of an elm tree about forty feet from the ground. The Bewick's Wren (*Thryomanes bewicki bewicki*) also chooses the same location year after year. At Delaware, Ohio, early in the season of 1903, two old Robins' nests in a cedar tree were used by Mourning Doves (*Zenaidura macroura carolinensis*) and at New Vienna this same thing has been observed. One pair has used the same Robin's nest in the cornice of a house for three successive seasons. A little lining is always added to the nest. In two instances old Brown Thrashers' nests were used and in one instance a Robin's nest was appropriated soon after the young left the nest.

In three instances I have observed Brown Thrashers completely renovating old last year's nests.

Two pairs of Robins (*Planesticus migratorius migratorius*) have used the same nest in cornices of the houses for several seasons. Both put in new mud and lining each time the nest was used.

A Catbird (*Dumetella carolinensis*) built on its old last year's nest.— MYRA KATIE ROADS, *463 Vine St., Hillsboro, Ohio.*

Protective Calls of Two Species of Birds.—In 'The Auk' for July, 1928, p. 302, Mr. A. L. Pickens' interesting article on the subject of warning noises by the Carolina Chickadee (*P. carolinensis*) exactly covers my own experience with the Black-capped Chickadee (*Penthestes a. atricapillus*) in both voice and actions. It was while examing a Chickadee in the gathering cage preceding banding that a new aspect of this habit was learned. The bird kept up a continual hissing, more prolonged and louder than that of any snake of my experience. With this, it gave utterance to a distinct explosive and throaty *huff, huff,* after the serious hissing. It differed from the explosive note given by these birds when disturbed on the nest. The bird's actions in preparing for the the *huff* note was to crouch, spread the wings and tail, nervously shaking the head from side to side, suddenly jerking both head and neck to the left and at a sharp right angle.

On June 1, 1931, I came upon a Ruffed Grouse (*Bonasa u. umbellus*) brooding her young. Immediately following her first outcries I heard her give a rasping hiss, sibilant and unlike the notes I have come to know in

connection with the species. Before I could mark down the hiding place of one of the small fleeing forms, the anxious mother was at my feet with the characteristic heart-pitying maneuvers. Twice she struck my moccasins as I attempted to walk, each time holding the bill against the moccasin perhaps five seconds and giving the deep throaty cry: *hurr-hurr-hs-s-s-s-s*, deliberately repeated again at a distance of four feet from me when the young were safely hidden. This time the bird pressed her bill against the earth, and the sides of the throat could be seen to expand and contract a little. The note had not the escaping steam quality of the Chickadee note but more nearly represented a coughing grunt.—Lewis O. Shelley, *East Westmoreland, N. H.*

RECENT LITERATURE.

Swarth's 'Avifauna of the Galapagos Islands.'—In the years 1905–1906 the California Academy of Sciences conducted an expedition to the Galapagos under the leadership of R. H. Beck which secured the largest and most representative collection of the birds of the archipelago that has ever been brought together, Beck with the assistance of his associates, E. W. Gifford, J. S. Hunter, and E. S. King obtaining in all 8691 specimens.

Mr. Gifford in 1913 began a report upon this material covering the orders Columbiformes to Pelecaniformes and later (1919) published the field notes dealing with the land birds, while the late Leverett M. Loomis prepared a revision of the Tubinares based mainly upon this collection. Nothing further was done, however, until Harry S. Swarth's appointment as Curator of Birds and Mammals at the Academy when he began the comprehensive report which is now before us.[1]

Mr. Swarth as his work progressed wisely decided not to limit his report to the collection of the expedition but to embody in it everything of importance relative to the ornithology of the islands so that the completed volume constitutes a virtual monograph of the Galapagos avifauna. At the outset he secured the loan, from Stanford University, of the material obtained on the Hopkins-Stanford Expedition which formed the basis of the publication of Snodgrass and Heller (1904), and in 1930 he visited the British Museum, the Rothschild Muesum and the United States National Museum, where most of the types of Galapagos birds are preserved, besides securing, through correspondence, information regarding material in other institutions.

Mr. Swarth is to be congratulated upon the result of his labors as his report is admirable in all respects. A full synonymy is given under each species, with exact data for the type specimen, followed by distributional notes and critical discussion of the material. Preceding the systematic report is an interesting historical summary of the ornithology of the islands and a nominal list of the 108 species and subspecies recognized, along with the three peculiar to Cocos Island which is considered as ornithologically part of the group. A good bibliography completes the volume. There is no account of habits, this being wholly a systematic report.

Forty-six "water birds" are reported from the islands, most remarkable of which is the peculiar Cormorant, *Nannopterum harrisi*, with a resident species of Duck, Heron, Man-o-war bird, Penguin, etc. and many migrant shore birds. Of "land birds" there are a peculiar Hawk, a Cuckoo, a

[1] The Avifauna of the Galapagos Islands. By Harry S. Swarth. Occasional Papers of the California Academy of Sciences, XVIII. Printed from the John W. Hendrie Publication Endowment. San Francisco, June 29, 1931. Pp. 1–299 with map and 57 text figures.

Barn Owl, a Short-eared Owl, a Crested Flycatcher and a Martin, together with three races of Vermillion Flycatcher, ten of the peculiar Mockingbird, *Nesomimus*, and thirty-seven forms of the Galapagos "finches" which Mr. Swarth has previously established as a separate family, Geospizidae, showing that the slender-billed genus, *Certhidea*, formerly referred to the Mniotiltidae is really most closely allied to the Grosbeak-like *Geospizae*. This last group has always been the outstanding feature of the Galapagos avifauna and the complicated inter-relationship of the species and subspecies and their peculiar occurrence on the different islands have long been a subject for discussion. According to Mr. Swarth "the only consistent handling of the situation would lie in giving a separate designation to the representative of each separate form on every island, whether obviously different or not." Not caring to go to that length he has tried to describe the variation that exists among the birds of each island, "adopting a conservative use of names to distinguish what appear to be the better defined forms." "Intergradation," he adds, "between different extremes occurs to a bewildering degree, so as to render any system of nomenclature more or less of an artificial procedure." Of the sixty-seven species and subspecies that have been described in this family Mr. Swarth recognizes but thirty-seven. In the species *Geospiza fortis* he combines nine described forms; 812 skins were available and after long and careful study of this material he found it utterly impossible to correlate the variations in bill proportions to any feature of distribution or environment. Apart from its interest to ornithologists this monograph will prove of great value to biologists who are interested in problems of variation and the excellent outline drawings of bills, maps of distribution and tables of measurements will furnish important data for specialists in this line of research.

The author finds it necessary to name but three new forms from the vast material before him namely, *Nesomimus parvulus wenmani* (p. 129) Wenman Island; *Geospiza septentrionalis nigrescens* (p. 185) Culpepper Island; and *Cactospiza pallida striatipecta* (p. 245) Chatham Island.

Mr. Swarth's volume constitutes, in our opinion, the outstanding contribution to the systematics of the Galapagos avifauna.—W. S.

Slevin's 'Log of the Schooner Academy.'—In connection with Mr. Swarth's account of the avifauna of the Galapagos it is opportune to have the narrative[1] of the voyage upon which his material was secured. This has been compiled by J. R. Slevin, herpetologist of the expedition, and is based upon the log of the vessel and the diaries of Mr. Slevin and of F. X. Williams entomologist of the party.

---

[1] Log of the Schooner "Academy" On a Voyage of Scientific Research to the Galapagos Islands 1905–1906. By Joseph R. Slevin. Occasional Papers of the California Academy of Sciences, XVII. Printed from the John W. Hendrie Publication Endowment. San Francisco, February 14, 1931. Pp. 1–162, pll. 1–16, and a map.

This volume is very interesting reading and gives one a vivid account of the islands and the arduous work of the expedition. One of the chief objectives was the securing of a series of the great tortoises for which the Galapagos are famous and naturally there is much about these interesting animals, of which no less than 266 specimens were obtained. There are sixteen excellent half-tones from photographs of scenery.—W. S.

Uchida's 'Birds of Mt. Fuji.'—The second volume of 'Photographs of Bird Life in Japan'[1] is very properly devoted to the species found on the most famous mountain of the Empire. On the northern slope of Mt. Fuji the Ministry of Agriculture and Forestry in 1924 established a bird preserve of some 30,000 hectares (about 75,000 acres) in an effort to protect the native insectivorous birds. These include 176 species of which 7 are permanent residents, 50 summer residents, 56 migrants, 45 winter residents, 16 birds of passage, and 2 stragglers. No less than 116 species remain to breed. The significance of these figures is apparent on comparison with the number found in the vicinity of Tokyo where only about 30 species breed although more than 200 are found at various times, due to the large number of migrants and winter residents. The large list of birds which breed about the base of Mt. Fuji is due to the extensive area of virgin forests and the varied topographic and ecological conditions ranging from steep mountain slopes to swamps and lakes that furnish ideal conditions for various species. On the other hand in autumn and winter when the summer residents and migrants have departed the area is comparatively deserted.

In an attractive series of 58 plates about 40 of the more conspicuous species are illustrated from photographs of the birds with their nests and eggs, each accompanied by a brief description in Japanese and English. The plates are preceded by an introduction of six pages of text describing the several areas of the region and are followed by a nominal list of the 176 species of Mt. Fuji, arranged by families, and accompanied by Japanese and scientific names. The text in the body of the book is entirely popular and in order to ascertain the technical name of a species figured on a plate, it is necessary first to note the English name, compare it with the Japanese name, and then by turning to the list at the back of the book and looking under the proper family, locate the same Japanese characters with the accompanying Latin name. For readers who are not acquainted with Japanese this is something of a puzzle, but the answer may be found in every case.

We know of no preserve in the world whose birds have been illustrated in such sumptuous style. Some of the plates are remarkable not only for their clearness but for the manner in which they have been reproduced,

[1] Photographs of Bird-Life in Japan, Directed by Dr. Seinosuke Uchida, Photographed by Kenji Shimonuira. Vol II, Birds of Mt. Fuji, 1931, Sanseido Co. Ltd., Tokyo, Osaka. Price 4 Yen. For a review of Vol. I, see 'The Auk,' 1930, p. 433.

and the authors are to be congratulated on the success of their efforts to illustrate the birds of this area in such a popular and attractive way.—T. S. P.

Low's 'Literature of the Charadriiformes.'—In 1924 Dr. Low published his excellent bibliography of the Charadriiformes covering the period from 1894, the last year included in the volume of the British Museum Catalogue devoted to these birds, up to the end of 1923. The titles were, however, selected and did not cover the entire field, only those of greater importance being included. The author has now issued a second edition[1] in which the number of items has been "doubled or trebled" and everything relative to Shore-birds included, while the subject has been brought up to the end of 1928 adding five years to the scope of the earlier edition.

The items are arranged by years under generic divisions which makes it easy to refer to the literature covering any species. There are 7770 items included in the bibliography.

We owe a debt of gratitude to anyone who undertakes the laborious work of compiling a bibliography and especially to one who, like Dr. Low, has covered such a large field and has returned to his task to make it more exact.—W. S.

Mills's 'Bird Memories of the Rockies.'—This little posthumous work[2] consists of six chapters which appeared as separate articles in various journals, and six apparently hitherto unpublished. They all treat of birds of the Rockies written in the author's well known attractive style and embodying his personal observations of the feathered denizens of Estes Park where he made his home. There are familiar accounts of the Nutcracker, Rocky Mountain Jay, Long-crested Jay, Ptarmigan and other Rocky Mountain species which do not often figure in popular literature and a chapter on the Wild Turkey in Alabama.

An appreciative sketch of the author by Mr. John T. Jacobs forms a preface to this attractive volume and a number of bird photographs serve as illustrations.—W. S.

Schorger's 'Birds of Dane County, Wisconsin.'—The second and concluding part of this excellent county list[3] is before us covering the Passerine families. It is a model for such publications and an illustration

[1] The Literature of the Charadriiformes from 1894–1928 with a Classification of the Order, and Lists of the Genera, Species and Subspecies. By G. Carmichael Low, M.A., M.D., F.R.C.P. Second Edition. London, H. F. & G. Witherby, 326 High Holborn, W. C. 1. Pp. i–xi + 1–637. Price 12 shillings 6 pence net.

[2] Bird Memories of the Rockies. By Enos A. Mills. With Illustrations. Boston and New York: Houghton Mifflin Company, The Riverside Press. 1931. Pp. i–xvii + 1–263. Price $2.50.

[3] The Birds of Dane County, Wisconsin. Part II. By A. W. Schorger. Reprinted from the Transactions of the Wisconsin Academy of Sciences, Arts and Letters, Vol. XXVI. Issued May, 1931. Pp. 1–60.

of the thoroughness of its author both in his field work and his knowledge of the literature of his subject. No less than 265 species are listed including four that are now extinct. Several interesting photographs illustrate the brochure.—W. S.

The Indiana Audubon Year Book.—The annual reports of Audubon Societies usually consist almost wholly of articles dealing with bird conservation or the economic value of birds but the Indiana report[1] for 1931 is brim full of ornithology. There is an excellent article on the Robin by Dr. Earl Brooks—"a collection of data, stories and incidents concerning Robins," including photographs of unusually situated nests and a map of recoveries of Robins banded in Indiana. Also papers on the Great Blue Heron, Prothonotary Warbler, Night Heron, Chat, etc., lists of rare birds in Indiana and a check-list of Indiana birds. Amos W. Butler has a paper on early days in Indiana and there is a biographical sketch of Col. Isaac W. Brown. Articles on aviculture and bird banding and bird protection complete this important publication.—W. S.

Second Supplement to Wayne's Birds of South Carolina.—This carefully prepared pamphlet[2] by Messrs. Alexander Sprunt, Jr. and E. Burnham Chamberlain contains notes on 197 species consisting of additions to the list and additional data on the occurrence of other species. Since the appearance of Mr. Wayne's list we learn that ten species which he included in a hypothetical list have been placed in "good standing" while twenty-six additional species have been recorded in the State. With the increase in observers more data are being secured from the interior counties, although most of the additional species were secured on the coast where the majority of South Carolina ornithologists are located. It is an excellent thing to have this valuable list brought up to date. The supplement is edited by Miss Laura M. Bragg.—W. S.

La Touche's 'Birds of Eastern China.'—Mr. La Touche's 'Handbook' begins its second volume with a consideration of the Coraciiformes as understood in Stuart Baker's 'Fauna of India' the classification of which is adopted in the present work.[3] The treatment follows that of the previous parts with very full descriptions, brief statements of range, and comments on habits, abundance and nesting. There are two plates illustrating the country under consideration. We congratulate the author on the progress that he is making and the general excellence of his work.—W. S.

---

[1] The Audubon Year Book. 1931. Published by the Indiana Audubon Society for Conservation of Bird Life. Pp. 1–88 with numerous text figures.

[2] Second Supplement to Arthur T. Wayne's Birds of South Carolina. Compiled by Alexander Sprunt, Jr. and E. Burnham Chamberlain. Contributions from the Charleston Museum, VI, 1931. Pp. 1–37. Price $1.00.

[3] A Handbook of the Birds of Eastern China. By J. D. D. La Touche. Vol. II, Part I. Taylor and Francis, Red Lion Court, Fleet Street, London, E. C. 4, May, 1931. Pp. 1–96, ppl. XIV–XV. Price 3 shillings 6 pence per part.

Berlioz's 'La Vie des Oiseaux.'—This little brochure[1] forms a volume of the 'Bibliothèque Générale Illustrée' and consists of a series of popular chapters on birds covering their general characters, morphology, biology, classification, geographic distribution, and utilization by man. There is a series of sixty excellent heliotype plates of birds from life, nests, etc., with explanations giving short accounts of the species illustrated and a brief bibliography of general works dealing with birds in general. The little volume is most attractively printed.—W. S.

Delacour and Jabouille on Birds of the Peracel Islands.—The Paracel Archipelago consists of 36 small islets lying off the coast of French Indo-China. Their avifauna is not numerous in species consisting of four Terns, two Boobies, a Man-o'-war Bird and one land bird, *Zosterops simplex*. These birds are considered at some length in the paper[2] before us and there are three colored plates depicting the water birds in two groups and the White-eye., also ten plates presenting views of the islands. The report is well gotten up and published in the 'Travaux du Service Oceanographique des Peches de l'Indochine,' a quarto.—W. S.

Bangs and Van Tyne on Birds of Laos and Tonkin.—The present report[3] covers the collection made by the Indo-China Division of the Kelley-Roosevelts expedition of the Field Museum, under the leadership of Harold J. Coolidge, Jr. Dr. Josselyn Van Tyne, junior author of the report, was in charge of the bird collecting assisted by Dr. Ralph E. Wheeler and Russell W. Hendee. During the time (February 11–July 7) that the expedition was in Tonkin and Laos, 387 species and subspecies were secured with 33 additional secured near Quang Tri, Annam.

The region covered, comprising the drainage system of the Riviere Noire in Tonkin and the vicinity of Phong Saly and the country west in northern Laos, was almost wholly unknown to zoologists which fact adds much to the value of the collection.

All specimens obtained are listed with full data and brief annotations are added on the colors of soft parts, relation to other forms, etc. Two forms are described as new; one, *Pitta nepalensis hendeei* (p. 65) Mouong Moun, Tonkin, in the present report, and *Phylloscopus pernotus* in a previous paper,[4] both, along with *Alcurus striatus*, are figured on two colored plates from paintings by Walter A. Weber.

The report is a valuable contribution to ornithology.—W. S.

---

[1] La Vie des Oiseaux par J. Berlioz, avec 60 Planches en Héliogravure. Bibliothèque Générale Illustrée. Les Éditions Rieder, Paris, 7 Place Saint-Sulpice. 1931.

[2] Memoir 3. Oiseaux des Iles Paracels par J. Delacour & P. Jabouille. January, 1930. Pp. 1–24, ppl. I–XIII.

[3] Birds of the Kelley-Roosevelts Expedition to French Indo-China. By Outram Bangs and Josselyn Van Tyne. Field Museum of Natural History, Publ. 290, Zool. Ser., XVIII, No. 3. Chicago, June 10, 1931. Pp. 33–119, map and two colored plates.

[4] Field. Mus. Nat. Hist., Zool. Ser., 18, No. 1, p. 4.

Lönnberg on Birds from Southern Gobi.—The Sino-Swedish Expedition to Central Asia under Dr. Sven Hedin (1927–1929) was not primarily concerned with zoological collecting but a number of birds were secured by the members and, although most of these had to be simply dried as mummies, they were easily identifiable and a list of them, with annotations, is presented in the paper[1] before us. Seventy species are listed, many of which were previously unknown from this little studied region, while the data presented sheds some light upon the migration routes of certain species.

In a previous paper[2] Dr. Lönnberg describes from the collection a new Gull *Larus melanocephalus relictus*.—W. S.

Taverner on Canada Geese.—It has been known for some time that a small Canada Goose occurred in migrations in the Mississippi Valley and casually on the Atlantic coast, similar to Hutchins's Goose but smaller, and for lack of definite knowledge of its breeding place it has been referred to the latter race, or to *minima*, which it resembles in size but not in color.

Mr. Taverner now shows[3] that the birds found breeding on Baffin Island by J. Dewey Soper, of the Canadian Arctic Expeditions, represent this form and that, furthermore, Richardson's name *hutchinsi* belongs to it rather than to the larger bird of the west, to which it has usually been applied.

We thus have five forms of these Geese instead of four which Mr. Taverner separates as follows:

(1) A large light-breasted form breeding across the continent; *canadensis*.

(2) A large dark-breasted form breeding on the Queen Charlotte Islands; *occidentalis*.

(3) A medium sized light-breasted form breeding in the northwest; *leucopareia* [several times spelled "leucoperia" in the paper before us] formerly known as *hutchinsi*.

(4) A small dark-breasted form breeding on the east coast of Bering Sea; *minima*.

(5) A small light-breasted form breeding in eastern Arctic America (Baffin Island, etc.) hitherto unrecognized but which is the *hutchinsi* of Richardson.

The three larger birds are regarded as races of *canadensis* but the two small ones Mr. Taverner prefers to consider as full species, though through an apparent slip of the pen he continues to call their characters "sub-

---

[1] A Contribution to the Bird Fauna of Southern Gobi. By Einar Lönnberg. Arkiv för Zoologi, Band 23A, No. 12, Pp. 1–18, August 4, 1931.

[2] A Remarkable Gull from the Gobi Desert. Arkiv för Zoologi, Band 23B, No. 2, pp. 1–5, June 1, 1931.

[3] A Study of *Branta Canadensis* (Linnaeus) The Canada Goose. By P. A. Taverner. Ann. Rept. Nat. Mus. Canada, 1929, pp. 30–40, pl. 1, fig. 1, 1931.

specific." This attitude regarding their specific relationship is taken because of the fact that *minima* and *leucopareia* have been found breeding together by Conover (Auk, 1926, 174) and *canadensis* and *hutchinsi* by Soper (1929).

Our author's points seem to be well taken and he is able to base his conclusions upon more definite data than have yet been available on the breeding ranges of the several forms.

As to his changes in the vernacular names of the birds we cannot agree. *Branta canadensis occidentalis* is changed from "White-cheeked Goose" to "Western Goose" because the Latin name *leucopareia* (i.e. white-cheeked) is applied to another form, but this hardly seems necessary since the ornithologists who are also Greek scholars are becoming so few that this inconsistency will hardly be noticed and the Queen Charlotte Goose is known through nearly all of our literature by the name "White-cheeked." The dropping of the name "Hutchins's Goose" may have more justification but in view of the rather indefinite understanding of this form that has always prevailed, it seems better to retain "Hutchins's" [not "Hutchin's" as our author has it] as the English name for the bird called "*hutchinsi*" instead of bringing in a new name "Richardson's Goose." For the other form a new name is of course necessary and "Lesser Canada Goose" is most acceptable.

Mr. Taverner is to be congratulated upon a most valuable contribution to the much vexed question of the Canada Geese and their relationships.—W. S.

Lowe on the Occurrence of Broadbills in Africa.—This notable paper[1] is primarily a detailed study of the anatomy of the curious little bird *Pseudocalyptomena graueri*, described by Lord Rothschild in 1909 from a single specimen secured by Rudolf Grauer in the bamboo forests of the region above Lake Kivu, Africa, and hitherto not rediscovered, although searched for by several explorers.

James P. Chapin has maintained that the true home of the bird was in the canyons above the bamboos and here it was finally obtained by Alan Moses of the Sterling Rockefeller-Charles Murphy Expedition from the American Museum of Natural History, and specimens in spirits were submitted to Dr. Percy R. Lowe for study.

Lord Rothschild struck by the apparently superficial resemblance of the remarkable bird to *Calyptomena* of the Malay region, a member of the Broadbill family (Eurylaemidae), named it as above. This family was supposed at that time to be restricted to the Oriental Region, covering part of India, the Malay countries and the Philippines and the possibility of its extension to Africa was not even suspected until in 1924, when Dr. Lowe proved that the supposed Flycatcher genus, *Smithornis*, of Africa,

[1] On the Anatomy of Pseudocalyptomena and the Occurrence of Broadbills (Eurylaemidae) in Africa. Proc. Zool. Soc. (London), Part II, June 29, 1931.

was really a Eurylaemid. Therefore the importance of an examination of the anatomy of *Pseudocalyptomaena* became at once evident.

Dr. Lowe's exhaustive study of the specimens shows beyond question that this little bird is really another African member of the Broadbill family while his deductions from this fact are even more interesting than his anatomical study. He finds evidence, especially in its skull structure, that this bird is slightly more generalized than the oriental Broadbills and hence probably represented a peripheral colony of Broadbills which was cut off from the center of distribution by severance of land connection or the dying out of possible connecting forms to the north, and has thus preserved for us an earlier type of Broadbill structure than is to be found in the main stronghold of the family today. Most remarkable of all, however, is the preservation of a Broadbill type of coloration. This suggests, as Dr. Lowe puts it, "that if environment in its broadest sense has any thing more than a survival influence then it is strange that such a superficial character as the distinctively Eurylaemid coloration has not ages ago been brought into line with the characteristic coloration of African birds in general." Yet, as he says, during the millions of years that this little bird has been isolated from its Oriental ancestors "not a detail of its anatomical "make up" appears to have been affected in the slightest degree, in so far as its likeness to the Eurylaemid picture is concerned."

In 'The Ibis' for 1925 Dr. Lowe calls attention to the importance of the study of color-pattern in birds as often of almost as much assistance in gaining phylogenetic clues as more deep seated structures, and the present reviewer emphasized the same point in a paper on 'The Phylogenetic Value of Color Characters in Birds' in the Journal Acad. Nat. Sci. Phila., XV, 1912, pp. 313–319.

Dr. Lowe has made a notable contribution to avian anatomy as well as to zoogeography.—W. S.

The Ornithological Journals.

Bird-Lore.—XXXIII, No. 3. May–June, 1931. A Day with the Birds of Glacier National Park. By Winton Weydemeyer.

The Prothonotary Warbler of the Willow Stub. By Lawrence H. Walkinshaw.—Nesting at Battle Creek, Mich., with photograph.

Dwellers of the Marsh Jungle. By Ben East.—At Grand Rapids, Mich., with photographs of the Long-billed Marsh Wren, Florida Gallinule Least Bittern and Black Tern.

In the Audubon Department Dr. A. A. Allen has an excellent life history of the Song Sparrow, while the Vesper Sparrow, from a painting by Allan Brooks, forms the color plate.

Bird-Lore. XXXIII, No. 4. July–August, 1931.

Mrs. Hummer at Home. By A. Margaret Heydweiller.

Sandpiper Town. By William A. Paff.—A study at Beach Haven, N. J. with photographs of the Sanderling, Turnstone and Semipalmated Plover.

Mockingbirds Nesting at Bangor, Maine. By Bertha L. Brown.

Factors in the Destruction of Birds' Nests. By Frederick T. Davis.

Dr. A. A. Allen has a splendidly illustrated article on the Florida Gallinule and the color plate represents the Cuckoos, with the usual discussion of plumages and migration.

The Condor. XXXIII, No. 4. July–August, 1931.

Birds and Eucalyptus Trees. By John McB. Robertson.

Winter Habits of the Hepburn Rosy Finch at Clarkston, Wash. By D. J. and A. M. Leffingwell. With photographs.

Egg-laying Record of a Captive Mourning Dove. By Margaret M. Nice.—Nine sets or fifteen eggs in sixty-nine days.

An Orangeless Mutant of the Varied Thrush and its Bearing on Sex Color-Differences. By J. Eugene Law.

Notes on Birds Observed along the West Coast of Hudson Bay. By G. M. Sutton.

The Tyranny of the Trinomial. By Harry S. Swarth.—Advocates caution in further trinomial union of hitherto distinct species, especially in joining American and European forms as subspecies, and agrees on the possibility of more or less arbitrary separation of certain long series of subspecies into several specific groups.

The Type Locality of the Verdin. By Joseph Grinnell.—Determined to be northern Lower California and the form from southwestern California is named *A. f. acaciarum* (p. 168).

The Wilson Bulletin. XLIII, No. 2. June, 1931.

Survival and Reproduction in a Song Sparrow Population During one Season. By Margaret M. Nice.

Notes on the Song and Territory Habits of the Bullock's Oriole. By Alden H. Miller.

The Status of the Goshawk in Pennsylvania. By George M. Sutton.

Birds of Southern Louisiana. By Alfred M. Bailey and Earl G. Wright.—With many beautiful photographs.

The Cardinal. III, No. 2. July, 1931.

Identification of Shore-birds. By John T. Nichols.

The Struggle for Existence. By Carl W. Schlag.—Titmouse nest attacked by Wrens.

A Glimpse of Audubon.—Extracts from Webber's 'Romance of Natural History' published in 1852, giving an account of a personal association with Audubon on his return from the Missouri River trip.

Bird-Banding. II, No. 3. July, 1931.

Returns of Song Sparrows in 1931. By Margaret M. Nice.

Banding of the Last Heath Hen. By Alfred O. Gross.—With photographs.

Progress of Conservation in Canada. By Hoyes Lloyd.

Return of Wintering Birds to Summerville, South Carolina. By William P. Wharton.

The Oölogist. XLVIII, No. 4. April, 1931.

Texas Vacationing. By Mrs. B. Reid.

Lapland Longspurs on a Lark. By J. D. Allen.—A flight of the birds through North Dakota in February.

The Oölogist. XLVIII, No. 6. June, 1931.

Notes on Birds of Prowers County, Colo. By Leon Kelso.—A long annotated list.

The Oölogist. XLVIII, No. 7. July, 1931.

Ospreys Nesting in Maryland. By W. A. Smith.—Eggs collected near Ocean City, Md.

The Monarchs of Petrajarvi. An account of Ospreys in Finland. Translated from the Finnish.

Iowa Bird Life. I, No. 2. June, 1931.

Contains many local notes, a paper by Miss Althea R. Sherman on "A Choice of Birds" and an account of the ninth annual meeting of the Iowa Ornithologists' Union.

The Raven (mimeographed journal). II, Nos. 6 and 7. June and July, 1931.

Devoted wholly to local notes from several localities in Virginia.

The Flicker (mimeographed journal). III, No. 2. 1931.

Local notes and articles on "Unusual Nesting Sites" by Alden Reiser and on "Bird Sounds at Night By Gustav Swanson.

The Migrant. II, No. 2. June, 1931.—Devoted to Tennessee birds.

Summer Warblers of Shelby County. By B. B. Coffey, Jr.

Nesting Data on Middle Tennessee Birds. By Vernon Sharp, Jr.

The Ibis. (XIII series) I, No. 3. July, 1931.

The Birds of "L'Ile de la Camargue et la Petite Camargue." By W. E. Clegg (continued).

Account of an Expedition to Sierra Leone and French Guinea on Behalf of the British Museum. By G. L. Bates with an Introduction by D. A. Bannerman.—The systematic list will follow.

John Latham an Early English Ornithologist. By G. M. Mathews.—An excellent biography with portrait.

The Birds of the Region South of Lake Nyassa. By A. H. Paget-Wilkes (continued).

On the Relation of the Gruimorphae to the Charadriimorphae and Rallimorphae, with special reference to the Taxonomic Position of Rostratulidae, Jacanidae, and Burhinidae with a suggested new order (Telmatomorphae). By Dr. Percy R. Lowe.—This important article presents

the results of much anatomical investigation of *Rostratula* from which the other lines of research developed.

Dr. Lowe's conclusions, briefly stated, are that the Rails form a distinct order more generalized and more primitive than the Gruimorphae (properly speaking), and that the latter are not separable as an order from the Charadriimorphae, while the Jacanidae, Burhinidae and Otitidae are to be associated with the Gruimorphae. To avoid confusion he proposes a new name "Telmatomorphae" for the entire assemblage. Rostratulidae he places at the bottom of the Limicolae as a separate family. We thus have as Suborders of the Order Telmatomorphae:

(a) Gruae (Gruidae, Psophiidae, Aramidae, Rhinochetidae, Eurypygidae, Otididae, Burhinidae, and Jacanidae.)

(b) Limicolae (Rostratulidae, Charadriidae, and Scolopacidae.)

(c) (Thinocorythidae, Glareolidae, Chionididae, Dromadidae, and Laridae.)

The family Cariamidae is suggested as a possible member of the Gruae.

Field-Notes on the Guiana King Hummingbird. By E. M. Nicholson.—An exhaustive life history.

Equatorial Reflections on Periodism in Birds. By E. E. Moreau.—After an eulogy upon the work of Rowan, the author proceeds to discuss some problems suggested to him by the latter author. His discussion is summarized in three statements: (I) That as to migrants which do not reach the tropics, Rowan's statement that they are subject to photoperiodism is accepted. (II) That of migrants that enter or pass through the tropics, Rowan's suggestion that they are actuated by internal rhythms based originally upon photo-periodism is approved as a working hypothesis. (III) Of birds passing their entire life in the tropics, many species, contrary to popular belief, seem to be subject to a periodism apparently fundamentally different from that actuating either of the other groups. Suggestions for lines of inquiry are offered.

In the numerous "Short Notes" we find a new name proposed by W. L. Sclater and C. Mackworth Praed, viz. *Serinus mozambicus grotei* (p. 581) for *S. m. aurifrons* preoccupied.

Bulletin of the British Ornithologists' Club. CCCLI, June 4, 1931.

W. L. Sclater describes the following: *Apalis moreaui* (p. 109), *Chlorophoneus nigrescens* (p. 110), and *Dioptrornis fischeri amani* (p. 112), all from the Amani forest in the Usambara District of Tanganyika.

David A. Bannerman: *Streptopelia roseogrisea bornuensis* (p. 115), northern Nigeria; *Stigmatopelia senegalensis thome* (p. 115), St. Thome Island; and *Columba livia atlantis* (p. 116), Azores.

Bulletin of the British Ornithologists' Club. CCCLII. July 15, 1913.

F. C. R. Jourdain describes a recent trip to Palestine and Syria.

David A. Bannerman describes: *Sheppardia cyornithopsis houghtoni*

(p. 128), near Freetown, Sierra Leone and G. M. Mathews, *Hypotaenidia philippensis norfolkensis* (p. 129), Norfolk Island.

British Birds. XXV, No. 1. June, 1931.

On a Remarkable Action-Photograph of a Montagu's Harrier. By R. R. Graham.—Feathers shown ruffled on the upper side of the wings by reverse air current as the bird checked its flight in alighting.

North Sea Migrants. By D. K. Wolfe Murray.—Dates and wind conditions.

The Display of the Mallard. By Henry Boase.

Manx Ornithological Notes. By P. G. Ralfe.

British Birds. XXV, No. 2. July, 1931.

Experimental Studies of the Ringed Plover. By George Marples.—Eggs buried in sand were dug out by the bird while those placed outside the nest were drawn back to it by arching the head over the egg and walking backward. Dummy wax eggs, painted to resemble the real eggs, were retrieved in the same manner as also eggs painted yellow, red and blue, but not those painted in dull tints like the surrounding pebbles, nor pebbles themselves shaped like the eggs. When the pebbles were painted like the eggs, however, they were retrieved and incubated.

British Birds. XXV, No. 3. August, 1931.

Breeding of the Whimbrel in Invennesshire. By A. H. Daukes.

Red-headed Bunting in Orkney—A New British Bird. By G. E. Todd.

Notes on the Songs and Cries of the British Nuthatch. By John Walpole-Bond.

The Oölogists' Record. XI, No. 1. March, 1931.

Field Work of the British Ornithologists' Union. By F. C. R. Jourdain.

Notes on a Visit to Algieres in Spring. By R. F. Meiklejohn.

Nesting of *Phalaropus lobatus* in Shetland. By W. E. Glegg.

Birds Observed in the Neighborhood of Angol, Chile. By D. S. Bullock.

The Oölogists' Record. XI, No. 2. June, 1931.

The Problem of the Cuckoo. By R. F. Meiklejohn.—Suggests that there is a certain amount of individual variation in habit in birds and that in the case of the Cuckoo's habits both sides may be right on disputed points.

The Problem of the Cuckoo. By E. C. Stuart Baker.—A rejoinder to the above.

Nesting of the Canada Jay. By T. E. Randall.

Notes on the Breeding of *Hirundo abyssinica unitatis*. By C. R. S. Pitman.

The Bateleur. III, No. 2. April, 1931.

Notes on Birds of Nkose Island, Victoria Nyanza. By C. R. S. Pitman.

African Bird Names in Nubian-Arabic. By H. F. S[toneham].

Birds of the Marsabit Mountain, Kenya Colony, Part IV. By H. B. Sharpe.

The Birds of Bahati Woods, Kenya Colony. By G. W. Jeffery. Part II.

The Bateleur. III, No. 3. July, 1931.

Waders at the Cape of Good Hope. By E. L. Gill.

The Stoneham Museum. An interesting account of this important institution.

We regret to learn that the world wide depression has so seriously affected the subscription list of 'The Bateleur' that it will be forced to suspend or possibly to broaden its scope so as to include other branches of science besides ornithology. We trust that the subscriptions which are solicited to keep up this valuable publication will be forthcoming.

The Emu. XXXI, Part 1. July, 1931.

The Status of the Spectacled Flycatcher of Australia. By K. A. Hindwood.—With a colored plate.

Scientific Collecting. By J. B. Cleland.—A list of requirements for one obtaining a permit.

Holiday Jaunts in New Zealand. By R. H. D. Stidolph. With list of birds and excellent photographs.

Notes on Four Species of Dotterels. By R. T. Littlejohns.—Beautiful photographs.

Birds of Port Stephens, N. S. W. By H. E. Hordern.

The Gray Goshawk in Captivity. By E. L. Hyem.

Birds of the Northern District, W. A. By C. F. H. Jenkins.

Additions to the Birds of the Kurrajong Upper Colo District. By K. A. Hindwood.

The Azure Kingfisher. By A. J. Marshall.

Notes on a Trip to the Macpherson Range. By N. J. Favaloro.

Food of the Red-capped Parrot. By J. Neil McGilp.

The Catbird. By Norman Chaffer.—The Australian Catbird is, by the way, a species of Bower bird an ally of the Birds of Paradise.

Eggs of the Banded Stilt. By F. E. Howe and J. A. Ross.

The Genus Arses in Australia. By George Mack.

A Queensland Sanctuary. By Lila M. Mayo.

This issue of 'The Emu' like others is notable for the beauty of its half-tone illustrations and demonstrates the high quality of ornithological photography in Australia. In this respect it leads the bird journals of the world unless it be 'Bird-Lore.' There are no less than nineteen full page plates in this number.

The South Australian Ornithologist. XI, Part 3. July, 1931.

The Night Parrot (*Geopsittacus occidentalis*). By J. Neil McGilp.

A Trip to Bool Lagoon. By J. Sitton.

Alauda. (Ser. II) III, No. 2. June, 1931. [In French.]

On the Presence of examples of the Form-Group *Alcedo atthis atthis* in the range of the race *A. t. hispidoides*. By A. Laubmann.

Extract from a Journal of Ornithological Observations at the Port of Geneva. By R. Poncy.

Mineral Composition of Birds' Egg Shells and the Nutrative Function of the Shell. By Heim de Balsac.

A Contribution to the Ornithology of the Eastern Pyrenees (continued). By H. Jouard.

Apropos of an Article by Jourdain on Our Present Knowledge of the Breeding Biology of Birds. By J. deChavigny.

A Contribution to a Study of the Molt of the Shearwaters (*Puffinus*). By N. Mayaud.

On the Wintering of *Turdus torquatus* in Algiers. By Heim de Balsac.

On Some Questions of Systematic Nomenclature. By G. Dementieff.—*Aquila chrysaetos daphanea* was described by Severtzow not Menzbier; *Aesalon columbarius insignis* is antedated by *A. columbarius alaudarius* of the same author, while his *Athene noctua orientalis* is the name for the race of Thian-Chan.

On the "Rhythm" of egg laying in Birds. By Heim de Balsac.

The Secret of the Grebe. By P. Madon.—Much attention given to the food of various Grebes and their habit of devouring their feathers.

L'Oiseau. (New Series) I, No. 4. April, 1931. (In French.]

The Gray Titmice of Europe. By M.. Legendre. (Continued in Nos 5–7.)

The Silver Oriole (*Oriolus mellianus*). By E. Stresemann.—With a colored plate.

Notes on the Birds of the Philippines II (continued). By M. Hachisuka in Nos. 5 and 7.

The Crossbill in the Finistre Provence. By F. Lebeurier.

A Curious Pathological Case of a Thrush. By E. Moreau.—Diseased skull.

The Nest of Swallows. By P. Jabouille.

Bird Cages for the House. By M. Legendre. (Continued in Nos. 5–7.)

L'Oiseau. (New Series) I, No. 5. May, 1931. [In French.]

Birds of the Genus Regulus of Europe. By M. Legendre.

The Crossbill Invasion of 1930. By R. Reboussin.

Aviculture in America. By J. Delacour.

Other Avicultural notes.

L'Oiseau. (New Series) I, No. 6. June, 1931. [In French.]

Localization and Ornithological Associations of the Territory of the Camargue. By R. Reboussin.

A Contribution to the Distribution of Birds in West Africa. By G. Bouet. (Continued in No. 7.)

L'Oiseau. (New Series) I, No. 7. July, 1931. [In French.]

On the Phylogeny of the Hummingbirds of the Genus Thalurania. By J. Berlioz.

Some New Remarks on Nomenclature. By J. Delacour.—Quotations from opinions of Dr. K. Jordan.

Journal fur Ornithologie. LXXIX, Heft 3. July, 1931. [In German.]

Stork Observations in 1930, in Oldenburg. By Tantzer.

Observations on the Feeding of Diurnal Birds of Prey and Owls in 1930. By O. Uttendörfer.

Birds' Eggs from Kansu. By M. Schönwetter.

On the Spreading of the House Sparrow. By W. S. Stachanow.—In the far East.

Passer domesticus in Mexico. By F. Heilfurth.

A Contribution to the Ornithology of Macedonia. By W. Banzhaf.

On the Biology of the Bittern (*Botaurus stellaris*). By R. Zimmermann.

On the Syrinx of some Song Birds of New Guinea. By E. Mayr.—*Gymnorhina*, *Melampitta*, and *Orthonyx*.

A Contribution to our Knowledge of the Plumages of the Snow Bunting. (*Plectrophenax nivalis nivalis*). By O. Natorp.

On the Habits and Breeding of *Haematopus ostralegus longipes*. By H. Grote.

A Contribution to the Breeding Habits of *Larus argentatus* and *Sterna sandvicensis*. By G. Steinbacher.

On the Alimentary Canal of the Dicaeidae: Its Form and Function. By H. Desselberger.

On the Habits of *Spermestes nigriceps*. By A. Adersparre.

An Investigation of the Function of the "Herbst" Corpuscles. By Hans Schildmacher.

Eiler Theodor Lehn Schiöler. By O. Helms.—In Memoriam—with a portrait.

Ornithologische Monatsberichte. XXXIX, No. 3. May–June, 1931. [In German.]

Blasius Merrem, the Author of the Generic Names *Philomachus* and *Calidris*. By O. Schnurre.—These names have been adopted in the A. O. U. Check List with their authorship anonymous.

On the Anatomy and Systematic Position of Salvadori's Duck (*Salvadorina waigiuensis*). By E. Mayr.—Allied to *Anas*.

On the Biological Significance of the Sex Dimorphism in the Rough-winged Swallows, *Psalidoprocne* and *Stelgidopteryx*. By G. Steinbacher.

Winter Observations at Malaga. By Leo von Boxberger.

Preliminary Report on the Ornithological Results of the Heinrich Expedition of 1930–31. By E. Stresemann.—This installment covers the ornithology of the Matinang Mountains, Celebes, with descriptions of

Cyornis sanfordi (p. 79) and new subspecies of *Dendrobiastes, Phylloscopus, Heinrichia, Geomalia, Pseudozosterops, Myza,* and *Centropus.*

In the Short Notes Grote (p. 91) proposes *Emberiza cabanisi cognominata* for *E. c. major* (Cab.) preoccupied.

Ornithologische Monatsberichte. XXXIX, No. 4. July, 1931. [In German.]

On the Ornithological Results of the Heinrich Expedition. By E. Stresemann.

Ornithology of Minahassa, North Celebes. *Eurostopodus diabolicus* (p. 103) and *Monachalcyon princeps erythrorhamphus* (p. 104) are described as new.

New Forms from Northern Kansu. By E. Stresemann. *Tribura major netrix* (p. 105) and *Parus rufonuchalis whistleri* (p. 107) are described as new.

On the Food of the Swamp Owl (*Asio flammeus*). By R. Gerber.

On the Greenland Fringillidae. By Finn Salomonsen.—Discussion of Schiöler's treatment of these birds.

Der Vogelzug. II, No. 3. July, 1931. [In German.]

New Recoveries of Banded *Corvus c. cornix.* By J. Thoenemann and E. Schuz.

Migration in Strong Adverse Wind. By Geyr V. Schweppenburg.

Migration against the Wind in Finch Flight. By R. Drost.

Phylloscopus in Heligoland. By Finn Salomonsen.—Three races present in migration.

Migration of Young Storks without Guidance of Adults. By Werner Ruppell.

Distinguishing Marks for Sex and Age in Migrant Birds. By R. Drost. —Deals with plumages of European species.

Returns of Banded Birds from Foreign Stations. By E. Schuz.

Beiträge zur Fortpflanzungsbiologie der Vögel. VII, No. 4. July, 1931. [In German.]

Observations on the Nesting of the Swamp Owl (*Asio flammeus*). By E. Christoleit.

Delay in Breeding Activities in the Nutcracker (*Nucifraga caryocatactes*) Due to Snow and Cold. By M. Bartels, Jr.

On the Biology of Cettia cetti cettioides. By K. A. Worobiew.

Inquiry on the Number of Eggs laid by three Species of Larks. By M. Naun.

Notes on Birds' Eggs from Central Polynesia. By G. Timmermann.

Observations on Breeding Terns. By Bruno Resuhr.

Beiträge zur Fortpflanzungsbiologie der Vögel. VII, No. 5. September, 1931. [In German.]

Breeding Habits of Birds of the Syrian Desert and Lebanon. By I. Aharoni.

Observations on the Nesting of *Charadrius dubius curonicus*. By G. Creutz.—With good photographs.

Observations on the Breeding of Cranes (*Megalornis grus*). By L. Schuster.

Der Ornithologische Beobachter. XXVIII, Heft 1. May, 1931. [In French or German.]

The Birds During the Snow of March, 1931. By Olivier Meylan.

Mass Deaths Among Birds. By A. Schifferli.

On Fringilla montifringilla. By A. Mathey-Dupraz.

Many local notes on Swiss birds in this and the following numbers.

Der Ornithologische Beobachter. XXVIII, Heft 9. June, 1931. [In German.]

The Italian Bird-Banding Station. By E. and T. Schuz.—With several photographs.

A New Way to Study Bird Flights. By Julie Schinz.

Der Ornithologische Beobachter. XXVIII, Heft 10. July, 1931. [In French or German.]

Apropos of the Reverse Migration Observed at Geneva in March. By R. Poncy.

Der Ornithologische Beobachter. XXVIII, Heft 11. August, 1931. [In German.]

The Blue-throat Formation. By Werner Sunkel.

On Time Symmetry in Bird Flight. By Ulrich A. Corti.

Ardea. XX, Afl. 1–2. May, 1931. [In Dutch or German.]

On the Pairing Biology of the Tern. By N. Tinbergen.—An important study of the nuptial performances.

The Copulation of the Sheld-Duck (*Tadorna tadorna*). By G. F. Makkink.

Bird Migration at Vlieland in September and October, 1930. By W. H. Van Dobben and G. F. Makkink.

Report on Bird Banding at the Wassenaar Station 1929–1930. By J. P. Bouma, L. J. Kleyn and J. C. Koch.

On the Status of the Stork (*Ciconia ciconia*) in Holland. By Fr. Haverschmidt. Other notes on birds of Holland.

Orgaan der Club van Nederlandsche Vogelkundigen. III, No. 3–4, March, 1931. [In Dutch.]

Sterna gelochelidon in Holland. By G. van der Meer.

Doves of the Genus Columba. By Snoukaert van Schauberg.

Numerous local notes and photograph of a Kingfisher's nest in a termites' nest.

Orgaan der Club Nederlandsche Vogelkundigen. IV, No. 1. July 1931. [In Dutch.]

Avifauna of the Island of Marken. By P. G. Op de Coul.

Food of the Kestrel (*Falco tinnunculus*). By J. P. Bouma and J. C. Koch.—An examination of 900 pellets showed 73.2% mice, and only 8.5% birds.

Each daily pellet contained one vertebrate rarely two.

Four-hundred Starlings Banded. By J. P. Bouma and J. C. Koch.

Short Notes on Birds of Holland and Reviews.

Le Gerfaut. 1930, Fasc. 4. [In French.]

Note on *Corvus frugilegus*. By F. Visart de Bocarme.

Bird Banding in Belgium. By C. Dupond.

Danske-Fugle. XII, No. 1. 1931. [In Danish.]

The 1930 Invasion of Crossbills. By P. Skovgaard.

Numerous notes on the birds of Denmark.

Ornis Fennica. VIII, No. 1. 1931. [In Finnish.]

Numerous notes on Finnish birds with migration tables.

Norsk Ornithologisk Tidsskrift. (III ser.), No. 11–12. 1931. [In Norwegian.]

The Bird Fauna of Jan Mayen. By J. L. C. Musters.

Other local articles and notes with an abundance of excellent photographs.

Tori. VII, No. 31. May, 1931. [In Japanese or English.]

Six Additions to the List of Japanese Birds. By Y. Yamashima. *Dryobates leucotos saghalinensis* (p. 1), n. subsp., Sagalin. Another is the North American Canvasback.

A Journey to the Island of Torishima, Seven Islands of Izu. By Y. Yamashima.

On *Rallina suzukii* and *R. fasciata*. By N. Taka-Tsukasa.

On the Ural Owl of Honshu, Japan. By N. Taka-Tsukasa.—*Strix uralensis momiyamae* (p. 14).

The Migration of Certain Birds in Tokyo and Vicinity. By N. Kuroda.

On a New Subspecies of Bubo blackistoni. By N. Kuroda.—*B. b. karafutonis*, Sakhalin. (p. 41.)

The Second Lot of Bird Skins from Southern Manchuria. By N. Kuroda.

On the Breeding Birds at Kitami, Hokkaido. By K. Kobayashi.

An Example of *Glareola maldivarum* from Honshu, Japan. By T. T. Momiyama.

Revista Italiana di Ornitologia. (Ser. II) I, No. 1. March, 1931. [In Italian.]

On *Cincia ibrida* taken in Italy. By E. Arrigoni degli Oddi.—With plate.—*Parus major* × *P. caeruleus*.

Turdus sibiricus in Italy. By A. Duse.

The Gannet in Italy. By E. Festa.

Recoveries of Banded Birds and an extensive bibliography and necrology.

Kocsag. IV, No. 1. 1931. [In Hungarian or German.]

Two Spring Months in Algeria. By W. M. Congreve.

Surnia ulula orokensis (p. 21) n. subsp. Ljugi, Siberia. By W. S. Stachanow.

Kocsag. IV, No. 2. 1931. [In Hungarian or German.]

Sketch of King Ferdinand of Bulgaria and his Museum.

On the Biology of the Cuckoo. By L. Dobay v. Dobo.

On Species Making in *Pseudalaudula*. By W. S. Stachanow and E. P. Spangenberg.

An Eyrie of *Falco cherrug* in the Vertes Mountains. By D. Radetzky.

Short Notes on Hungarian birds.

Kocsag. IV, No. 3. 1931. [In Hungarian or German.]

Sketch and Bibliography of Dr. Julius Madarasz.

Ornithological Experiences on Two expeditions to Spitzbergen. By Carl H. Hennicke.

On Nests of *Aquila pomarina* in Hungary. By I. Kiraly.

Observations on Bird Migration in Italy, Sicily and North Africa. By Otto Steinfatt.

The Avicultural Magazine. (Ser. IV) IX, Nos. 3–8. March to August, 1931.

Colored Plates in the several numbers as follows: Racket-tailed Parrot (*Prioniturus platurus*), Rothschild's Grackle (*Leucopsar rothschildi*), Duyvenbode's Lory (*Chalcopsittacus duyvenbodei*), Red-breasted Parrot (*Poicephalus rufiventris*), Aru Island Parrot (*Geoffroyus aruensis*), Natal Pigmy Kingfisher (*Ispidina picta natalensis*).

A Bird Paradise. By H. Moore.—The island of Jamaica (April.)

Display of the Australian Bustard. By R. R. Minchin (May).

The First Importation of the Hoatzin (July).

Notes on Various Rare Pittas. By Sydney Porter (August).

Aviculture. (Ser. II) III, Nos. 3–8. March–August, 1931.

Colored plates in the several issues as follows: Green Pigeon (*Crocopus phoenicopterus*), Blue Rock Pigeon (*Columbia livia*), and Red-wattled Lapwing (*Sarcogramus indicus*), in March; Spix Macaw (*Cyanopsittacus spixi*), in April; Blue-breasted Roller (*Coracias cyanogaster*), in May; Crimson-breasted Conure (*Pyrrhura rhodogaster*), in June; Mexican Black headed Oriole (*Icterus melanocephalus*), in July; and Black-headed Partridge (*Alectoris melanocephala*), in August.

Notes on Birds of Nonsuch Island, Bermuda. By William Beebe (April).

The Distinctive Bird of Bermuda. By Karl Plath (April).—Good photographs of the Yellow-billed Tropic Bird.

Aviculturists Seek the Masked Bobwhite in Mexico. By W. J. Schefler.

An Account of the Trip. By Ralph H. Woods (June and July).—Failed to find the bird but secured many other species.

Ornithological Articles in Other Journals.

Bailey, H. H. Bulletin No. 6. Bailey Museum and Library of Natural History. June 15, 1931.—Notes on Swainson's Hawk in Florida; an unusual set of Wilson's Plover; Audubon's and Sooty Shearwaters in Florida; and The Florida Burrowing Owl.

Bond, James. A New Nuthatch from the Island of Grand Bahama. (*Proc. Acad. Nat. Sci. Phila.*, 1931, p. 389, July 24.—*Sitta pusilla insularis.*

Kuroda, Nagamichi. Watase's Line in the Geographic Division of Southern Japan. (*Dobutsugaku Zasshi*, Vol. 43, pp. 172–175, April 15, 1931. Tokyo.)

Robinson, H. W. Dates of Arrival of the Chiffchaff. (*The Naturalist*, June 1, 1931).

Stephens, T. C. Bird Records of Two Winters, 1920–1922, in the Upper Missouri Valley. (*Proc. Iowa Acad. Sci.*, 1930, pp. 357–366.)

Storer, Tracy I. Results of Bird and Animal Introduction with Especial Reference to California. (*Monthly Bull. Dept. Agric. Calif.*, April, 1931.)

Storer, Tracy I. A Partial Bibliography on the Natural History of California. (*News Notes of California Libraries*, Vol. 25, No. 1, January, 1930.)

Wetmore, Alexander. A field with the Birds of Northern Spain. (*Explorations and Field Work of the Smithsonian Institution in 1930.*)

Wetmore, Alexander and Perrygo, Watson. The Cruise of the "Esperanza" to Haiti. (*Explorations of the Smithsonian Institution in 1930.*)

Strecker, John K. Field Notes on Western Texas Birds (Part One). (*Contributions from Baylor University Museum*, No. 22, May 15, 1930.)

Swarth, Harry S. Geographic Variation in the Richardson Grouse. (*Proc. Calif. Acad. Sci.* (IV ser.), Vol. XX, No. 1, pp. 1–7, May 22, 1931.)—In this paper the author presents evidence to show that while there are two forms of this Grouse in British Columbia as Mr. Taverner claimed when he proposed *D. r. flemingi, richardsoni* is the dark one and not the light one as Mr. Taverner supposed. Therefore *flemingi* becomes a synonym of it and the pale bird is renamed *D. o. pallidus* (p. 4), type locality, Cornucopia, Oregon.

van Rossem, A. J. Descriptions of New Birds from the Mountains of Southern Nevada. (*Trans. San Diego Soc. Nat. Hist.*, Vol. VI, No. 22, pp. 325–332, June 5, 1931.)—But little collecting has apparently been done in the area covered by Mr. van Rossem's explorations of 1930 and several isolated and undescribed races were found on the Charleston and Sheep Mountains of Clark County which reach respectively the Arctic-Alpine and Hudsonian Zones. These are *Cyanocitta stelleri per-*

contatrix (p. 328), *Sitta pygmaea canescens* (p. 328), *Certhia familiaris leucostricta* (p. 329) and *Junco oreganus mutabilis* (p. 329).

Mr. van Rossem has also some pertinent remarks regarding the faunal relationship of the region which is more allied to the Rocky Mountains than to the coastal ranges, and some discussion of variation in the genus *Junco*, in which he distinguishes "quantitative" and "qualitative" differences as did the late Dr. Dwight, but with somewhat different interpretation. While trinomials are admirably suited to designating the former they are, he claims, not satisfactory for the latter which he regards as mutational.

Schumann, Ad. King Ferdinand of Bulgaria. (*Bull. Royal Inst. Hist. Nat., Sophia, Bulgaria*, IV, 1931, pp. 1–16.)—An interesting sketch of the well known scientist on the occasion of his seventieth birthday, fully illustrated.

Shaver, Jesse M. and Roberts, Mary B. Some Nesting Habits of the Cardinal. (*Jour. Tennessee Acad. Sci.*, V, No. 4, October, 1930.)—Contains much original matter, especially concerning the activities of the male during nest building.

Lewis, Harrison F. Notes on Bird of the Labrador Peninsula in 1930. (*Canadian Field Naturalist*, May, 1931.)

Lewis, Harrison F. Five Years Progress in Bird Sanctuaries of the North Shore of the Gulf of St. Lawrence. (*Canadian Field Naturalist*, April, 1931.)

Mousley, H. Reminiscences of the Life Home of the Black-billed Cuckoo. (*Canadian Field Naturalist*, April, 1931.)

Hamm, T. H. and Hollom, P. A. D. The Great Crested Grebe Inquiry, 1931. (*Scottish Naturalist*, March–April, 1931.)

Rollen, Noble. The Varying Length of Lark Song. (*Scottish Naturalist*, March–April, 1931.)—About 2.22 min. on the average, sometimes as long as 15 min. or even half an hour.

Stenhouse, J. H. Swifts vs. Starlings and Sparrows. (*Scottish Naturalist*, May–June, 1931.)

Johnson, C. W. Nestling Birds Destroyed by Larvae of Protocalliphora. (*Bull. Boston Soc. Nat. Hist.*, April, 1931.)—Destroy all of the first brood nests as soon as the fledglings leave, as a precaution.

Laing, Hamilton. Hooting of the Blue Goose. (*American Forests*, May, 1931.)

Sprunt, Alexander, Jr. Birds of the Bible. (*American Forests*, April, 1931.)

Bowen, W. Wedgwood. A New East African Francolin. (*Proc. Acad. Nat. Sci.*, 1931, pp. 301–303, May 30.)—*F. jacksoni gurae.*

Bonar, H. N. The Oyster-catcher (*Haematopus pstralegus*): From Personal Observation. (*Scottish Naturalist*, July–August, 1931.)

Farley, Frank L. Nesting of Bonaparte's Gull in Central Alberta. (*Canadian Field Naturalist*, September, 1931.)

Snyder, L. L. Is Gambel's Sparrow an Ontario Bird? (*Canadian Field Naturalist*, September, 1931.)

Terril, L. McI. Occurrence of the Pomarine Jaeger in the Montreal District. (*Canadian Field Naturalist*, September, 1931.)

Official Canadian Record of Bird-Banding Returns.

Grimes, S. A. 1930 Nesting Notes from the Jacksonville Region—II. (*Florida Naturalist*, July, 1931).

Bowdish, B. S. Seabirds of New Jersey. (*New Jersey Audubon Bulletin*, No. 57, September, 1931.)—A survey of the nesting colonies of seabirds on the coast of New Jersey, from Beach Haven to Wildwood Crest, by the writer and Mr. R. P. Allen, with information added from observations of Messrs. J. K. Potter and C. A. Urner. They estimate the total breeding birds as Common Tern, 1,013 pairs; Roseate Tern, 4 pairs; Least Tern, 59 pairs; Black Skimmer, 263 pairs; and Laughing Gull, 900 pairs.

In spite of the gratifying return of these birds their continued existence on this coast is a precarious one, not from actual persecution but from the constant draining of the marshes and dredging of the channels in the interest of commercial development and real estate speculations. Whether anything can be done in the way of securing absolutely necessary sanctuaries is open to question.

Bailey, Alfred M. A Phantom of the Marshes. (*Natural History*, March–April, 1931.)—The King Rail, with excellent illustrations.

Pettingill, O. S. To the Last Bird. (*American Forests*, June, 1931.)—Account of the last Heath Hen on Martha's Vineyard.

Bump, Gardiner. Roughing It with the Ruffed Grouse. (*American Forests*, July, 1931.)

Dixon, Joseph. Save the Trumpeter Swan. (*American Forests*, August, 1931.)

A thorough search and study of this rare species in the Yellowstone Park resulted in establishing the fact that four pairs of the birds bred there in 1930, but only six young were successfully reared. The destruction of the others was attributed to Otters.

Thompson, Ben H. A Pond at Dusk. (*American Forests*, September, 1931.)—Account of a Wood Ibis in Yellowstone Park, with a photograph by Joseph Dixon.

Excellent photographs illustrate the paper.

OBITUARIES.

George Lincoln Fordyce, a Member of the American Ornithologists' Union, died June 25, 1931, at his home in Youngstown, Ohio. He was born at Scipio, near Auburn, New York, September 29, 1860. He was married in 1890 and is survived by his wife and two daughters. A son, George Lincoln, Jr., died in 1900 at the age of eight. Fordyce became an associate of the Union in 1901 and was elected a member in 1921.

In 1876 he began his business career as clerk in a general store at Scipio. Later he was employed in a bank in Auburn and in 1883 he moved to Youngstown and founded a dry-goods business which was highly sucessful. He was very active in civic affairs, being at various times president of the Y. M. C. A. and the Boy Scouts Council, chairman of the Republican County Committee, member of the Library Board and director of several companies and banks. His chief charitable work was with the Youngstown Hospital Association, of which he was president for twenty-three years. He aroused community interest in this enterprise and under his guidance it developed into a great institution with two large modern hospitals.

He was, however, best known as a lover and protector of birds. As a boy he had been intensely interested in nature, and in the bank at Auburn he found a kindred spirit in a fellow employee, Samuel F. Rathbun, who was already a skillful bird student. The two boys spent many hours together on bird study trips and cemented a lifelong friendship. This was the beginning of Fordyce's serious interest in birds. At first, owing to limited time for his hobby, he confined his attention to the Raptores, which were also the principal interest of Sam Rathbun. He was not, however, a collector. Dead specimens of birds did not appeal to him but his interest was in the secrets of their lives. He always strove to increase his knowledge of living birds and what he learned was not forgotten. He developed the art of field identification to a high point and his ability in this line was unsurpassed. However, he recognized the limitations of this method and was exceedingly careful not to accept any dubious records.

For many years he kept records of the spring migration for the Biological Survey and published these records locally. In the fall of 1913 he collected a Western Grebe on one of the lakes in Mill Creek Park and thus established an Ohio record for this species. From 1920 to 1922 he served as treasurer of the Wilson Ornithological Club.

Each year George L. Fordyce would give from fifteen to twenty-five illustrated lecturers and he did much to awaken and further popular interest in nature and outdoor life. He was recognized as an authority in a large section of Ohio and Western Pennsylvania and received numerous inquiries, all of which he carefully investigated and answered.

His influence as a conservationist will long be felt in this community

and his loss is deeply mourned by those who profited by his counsel and enjoyed his companionship in the study of birds.—G. M. Cook.

Daniel William Shea, of Washington, D. C., an Associate of the American Ornithologists' Union since 1917, died at his home at Greenland, near Portsmouth, N. H., Oct. 17, 1930.

He was the son of Timothy and Margaret McCarthy Shea and was born in Portsmouth Nov. 27, 1859. He graduated from Harvard University in 1886 with the degree of A.B., and in 1888 with the degree of A.M. In 1892 he received the degree of Ph.D. from Friedrich Wilhelm University in Berlin. From 1886 to 1888 he was a member of the legislature in the House of Representatives of New Hampshire.

Prof. Shea was primarily a physicist and served as Assistant in Physics at Harvard in 1889 and 1892, Asst. Professor in the University of Illinois in 1892–93, and Professor in 1894–95. He took up his residence in Washington, D. C., in 1895, on receiving an appointment as Professor of Physics at the Catholic University and later served as General Secretary from 1897 to 1903, Director of the School of Technology from 1897 to 1905, and Dean of the School of Science until 1915. His publications were chiefly in Physics and included 'Instruction Sheets for Experiments in Physics,' and contributions to the 'American Journal of Science,' 'Annalen der Physik,' 'Physics Review' and other publications.

Prof. Shea was deeply interested in birds but seems to have published little in ornithology. He was a member of the Audubon Society of the District of Columbia and attended the A. O. U. meetings in Washington.—T. S. P.

Henry Lane Eno, of Princeton, N. J., elected an Associate of the American Ornithologists' Union in 1918, died at Montacuto House, Somerset, England, Sept. 10, 1928. He was 57 years of age, having been born in New York City, July 8, 1871.

Mr. Eno was much interested in birds and shortly after his election to the Union contributed a few notes to 'The Auk' on the occurrence of rare birds in the vicinity of Princeton. He was also much interested in the bird life of Mt. Desert Island, Maine, particularly that part adjoining Bar Harbor, which was included in the Sieur de Monts National Monument, and subsequently became known as the Lafayette and later as the Acadia National Park. He prepared a bulletin on 'The Sieur de Monts National Monument as a Bird Sanctuary' which appeared in 1916 as Sieur de Monts Pub. No. III, and contained an account of the physical characters of the island and its importance as a refuge on account of its location on one of the principal migration routes. Soon after, on Aug. 11, 1917, Mr. Eno was appointed Assistant Custodian of the Monument and on July 12, 1919, ornithologist of the Park, a position which he held until March 30, 1925. During the eight years that he was connected with the administration of the reservation he made observations and collected material for publication on the avifauna of the area.—T. S. P.

NOTES AND NEWS.

Dr. A. K. Fisher retired from the Bureau of Biological Survey, U. S. Dept. of Agriculture on August 31, 1931, after a service of more than 46 years. He assisted Dr. C. Hart Merriam in 1885 in organizing the section of Economic Ornithology which later became the Biological Survey and has taken an active part in the operations of the Bureau ever since, carrying on investigations, in bird migration, geographic distribution of birds and mammals, and economic relations of Hawks and Owls, while in 1915, he was placed in charge of the predatory animal control. Dr. Fisher was always deeply interested in game protection and was one of the early advocates of stopping spring shooting while he was a member of the committee which prepared the original regulations under the Federal Migratory Bird Law.

He is a Founder and past president of the American Ornithologists' Union and member of many other scientific societies. He was a member of the Death Valley Expedition, the Harriman Alaska Expedition and the Pinchot Expedition to the South Pacific.

His hosts of friends in all parts of the country especially those who have enjoyed his hospitality at the Biologists' Field Club on the Potomac will join in congratulating him, on his splendid service to natural history and wish him all enjoyment that the relief from official work will bring. Dr. Fisher, we understand, now becomes a zoological collaborator of the U. S. National Museum.

Mr. Otto Widmann, celebrated his ninetieth birthday on June 15, 1931, being the first American ornithologist to reach that advanced age. The members of the St. Louis Bird Club paid him personal tribute in commemoration of the event and letters, telegrams and flowers poured in from his friends in all parts of the country.

The Academy of Natural Sciences of Philadelphia has had a number of ornithologists in the field during the past year. M. A. Carriker has just returned from a second collecting trip to Peru, W. W. Bowen from a summer's work in Trinidad with Mr. Radcliffe Roberts, while Wharton Huber, who spent the summer with Mr. Henry Drinker, 3rd., in the mountains of New Mexico, has returned with some interesting material. James A. G. Rehn is still in Matto Grosso, Brazil, with the Johnson Expedition collecting zoological material of various knids.

The Annual Meeting of the St. Louis Bird Club was held on March 12, 1931 and the following officers were elected for the ensuing year: Dr. L. H. Behrens, President, J. Lawrence Hawk and Prof. L. M. Dougan, Vice-Presidents, and Mrs. George F. Tittmann, Secretary-Treasurer.

Dr. C. Hart Merriam, founder and former Secretary and President of the American Ornithologists' Union, was awarded the Roosevelt Medal on June 23, 1931, in recognition of his distinguished service in the advancement of the study of natural history. He was one of the three to receive the honor this year, the others being Benjamin N. Cardozo, for development of the Law, and Hamlin Garland, novelist and historian.

In the July 'Auk' the shortening of the duck season by fifteen days was announced. Since that time the results of the prolonged drought have been seen to be even more serious than at first supposed and a further shortening of the season was declared probable in an announcement of the Biological Survey on July 29. This was followed by a presidential proclamation on August 25 establishing a season of one month as suggested by the Survey, which provided an open season of October 1–31 for New York (exclusive of Long Island), Pennsylvania and all states to the north, also for those north of the Ohio River, Missouri and Kansas and northward. South of this area the season was to be November 16–December 15, as in California, except Florida which was November 20–December 19.

Then in response to the claims of unfairness to sportsmen in part of the northern division, changes were made September 12 as follows: Massachusetts, Connecticut, Rhode Island and Illinois, November 1–30; Ohio and Indiana, October 16–November 15; Iowa, Missouri, Nebraska, Kansas, and Oklahoma, October 20–November 19; and Nevada, Oregon and Washington November 16–December 15. No change was made in the southern division.

While most sportsmens' and conservation organizations have approved of this wise movement of the Biological Survey, the 'More Game Birds in America Foundation' has protested vigorously, on the grounds of loss in employment and to dealers in sportsmen's goods and has suggested as an alternative a limit of three days a week without change in season, while the National Association of Audubon Societies calls for a moratorium of a year on all duck shooting. So do opinions on conservation differ! However we feel that the plan adopted by the Biology Survey in this matter is the wisest one and we trust that every sportsman will do his best to live up to the law and encourage others to do so.

At the last annual meeting of the National Association of Audubon Societies, held in New York, Oct. 28, 1930, a committee consisting of: Dr. Thomas Barbour, Director of the Museum of Comparative Zoology, and Chauncey Hamlin, President of the Buffalo Museum of Science, was appointed at the request of President Pearson to investigate certain charges made against the Association. Under date of Aug. 19, 1931, the committee has made a comprehensive report of twelve closely printed pages, discussing in detail each of the principal charges, viz: the matter of the "Gunmaker's Money" of 1911, the McIlhenny Duck Shooting Club Project of 1923, and the failure of the Association to support the

recent efforts to bring about a reduction in bag limits on migratory game.

In conclusion the committee reports: "We believe that the Association has served a most creditable purpose. We believe that it has accomplished great ends—and that the funds entrusted to it have been well expended. . . . After a full investigation we feel that the Society may be proud of a great record and that such trifling missteps as have possibly been made from time to time are due to the inevitable frailties of mere men."

THE ANNUAL MEETING of the American Ornithologists' Union will be held this year in Detroit, Mich., October 19 to 22. Headquarters will be at the Book-Cadillac Hotel where both the business and public sessions will be held. On Wednesday the Union will visit Ann Arbor where the program for that day will be presented in the Museum of the University of Michigan. An attractive program has been prepared by the Local Committee under the chairmanship of Mrs. Etta S. Wilson and arrangements have been made for several interesting trips to points in the city and in the vicinity of Detroit.

This is the second meeting to be held in the Middle West and it is hoped that many members who find it impossible to attend the conventions in Boston, New York, Philadelphia, and Washington will have an opportunity to attend the sessions in Detroit and take part in the various activities.

IN closing the 1931 volume of 'The Auk' the present editor completes his twentieth year in that capacity. His predecessor, the late Dr. J. A. Allen, as is generally known, served for twenty-eight years which in conjunction with his eight years editorship of the 'Nuttall Bulletin' constitutes one of the longest editorial careers in scientific literature. Owing to the constantly increasing activity of American ornithologists the size of 'The Auk' volumes has materially increased in recent years so that we find that the total numbered pages of Dr. Allen's twenty-eight volumes (exclusive of "contents" and other introductory matter) total 12,502 while those of the last twenty volumes amount to 12,464, an almost equal amount of ornithological matter as the volumes stand on the library shelf.

THE editor would again express his indebtedness to Dr. T. S. Palmer and Mr. William Vogt for their kindness in reading proof of the present number while he was suffering from illness and in the exigencies of getting the 'Check-List' through the press.

THE Check-List was unavoidably delayed at the last minute and copies were not distributed until October 1, 1931.

INDEX TO VOLUME XLVIII

[New generic, specific and subspecific names are printed in heavy face type.]

ABYSSINIA, birds of, 140.
Academy of Natural Sciences of Phila., Expeditions of, 649.
Acanthis flammea, 465.
linaria linaria, 132.
Accipiter cooperi, 374, 619.
nisus, 458.
velox, 117, 125, 237, 374, 619.
Actitis macularia, 368, 421.
Adams, William C., wild life administration and the fish and game commissioner, 47–51.
Aechmorhynchus cancellatus, 465.
Aethocorys personata intensa, 466.
Africa, birds of, 147, 150, 285, 288, 295, 304, 305, 455, 459.
Agelaius icterocephalus, 58.
phoeniceus, 371.
p. fortis, 61.
p. mearnsi, 252.
p. phoeniceus, 238, 251.
p. richmondi, 65.
p. sonoriensis, 61.
ruficapillus, 58.
thilius, 58.
Aglaiocercus, 294.
Aix sponsa, 375, 565, 572.
Alabama, birds of, 595.
Alaska, birds of, 265, 269.
'Alauda,' reviewed, 314, 468, 638.
Alberta, 261, 418, 511.
Albinism, 603.
Alca torda, 591.
Allan, Philip F., see Jackson, C. F.
Alle alle, 105.
Allen, Glover M., review of Schioler's 'Birds of Denmark,' 457; notice of his 'The Birds of Liberia, 295.
Allen, Robert P., Snowy Owl in Maryland, 267; Water-Turkey nesting in North Carolina, 592; see also, Norton, Arthur H.
Alophoixus phaeocephalus, 461.
Amazilia tzacatl tzacatl, 481–500.
Amazona gueldingi, 159.
versicolor, 159.
imperialis, 159.
Amblyrhamphus holosericeus, 58.
American Ornithologists' Union, forty-eighth stated meeting of, 66; report of the secretary, 81; report of the committee on biography and bibliography, 87; Detroit meeting of the, 331, 480, Quebec meeting of the, 331; Check-List, 523–531, 651.
Ammodramus savannarum australis, 252, 610.
s. bimaculatus, 62.
Ammospiza caudacuta caudacuta, 610.
c. diversa, 610.
Amphispiza belli xerophilus, 360.
bilineata tortugae, 307.
b. cana, 307.
Anas platyrhynchos, 236, 373, 414, 572.
rubripes rubripes, 236, 565.
Andrews, Clement Walker, obituary of, 329.
Anhinga anhinga, 235, 592.
Ani, 250.
Antarctic regions, birds of, 141.
Anthus pratensis, 458.
spinoletta rubescens, 254.
Antrostomus carolinensis, 121.
Ant-thrush, Bolivian, 54.

Apalis, 292.
Apaloderma narina littoralis, 466.
Aphelocoma californica immanis, 431.
cyanea, 251.
Apteryx, 300.
Aquila chrysaetos, 118.
c. canadensis, 619.
Arborophila diversa, 307.
Archibuteo lagopus sancti-johannis, 573.
Archilochus colubris, 532–537, 574.
'Ardea,' reviewed, 158, 316, 641.
Ardea herodias herodias, 236, 259, 367, 567–569, 573, 592.
Arenaria interpres morinella, 421.
Arizona, birds of, 294.
Arkansas, birds of, 235, 301.
Arundinicola leucocephala, 55.
Asia, Central, birds of, 630.
Asio flammeus, 134, 282, 425, 573.
Astragalinus psaltria hesperophilus, 61.
tristis tristis, 238, 273, 372.
Astur atricapillus atricapillus, 618.
a. striatulus, 618.
badius chorassanicus, 157.
Ateleodacnis bicolor, 570.
margaritae, 570.
Athabasca, birds of, 306.
Audubon, John J., 305.
Auk, Razor-billed, 591.
'Auk, The,' committee on the Fourth Ten Year Index to, 333; twenty years of, 651.
Auriparus flaviceps fraterculus, 307.
f. ignatius, 460.
Austin, Oliver L., and Oliver L., Jr., food poisoning in shore birds, 195–197.
Austin, Oliver L., Jr., Clay-colored Sparrow on Cape Cod, 126.
Avery, Carlos, obituary of, 322.
'Aviculture,' reviewed, 317, 643.
'Avicultural Magazine,' reviewed, 158, 317, 643.
Avocet, 280.

Baeolophus bicolor, 239.
Baerg, W. J., notice of his 'Birds of Arkansas,' 301.
Bagg, Aaron C., another nesting record of the Goshawk for Massachusetts, 424; Barn Owl nesting in the Connecticut Valley, Massachusetts, 599.
Bailey, Alfred M., see Wright, Earl G.
Bailey, H. H., notice of his Bulletin No. 6, 644.
Baker, E. C. Stuart, review of his 'Game Birds of India, Burma and Ceylon,' 144.
Baldpate, 572, 615.
Baldwin, S. Prentiss, notice of his 'Bird Banding by Systematic Trapping,' 459.
Ball, W. Howard, Leach's Petrel in the District of Columbia, 106; Baird's Sandpiper at Washington, D. C., 260; Black Vulture at Harper's Ferry, W. Va., 599.
Ball, W. Howard, and Court, E. J., Magpie at Point Lookout, Maryland, 604.
Bangs, O. and Van Tyne, J., birds of Laos and Tonkin., 629.
Bannerman, David A., review of his 'Birds of Tropical West Africa,' 285; personal mention, 331.
Bartramia longicauda, 60, 376, 421, 442.
'Bateleur, The,' reviewed, 313, 467, 636.
Bates, John Mallory, obituary, 162.
Beatty, Harry A., notice of his 'Notes on Birds Observed at Guanica Lagoon,' 305; notice of his 'Birds of St. Croix,' 147.
'Beitrage zur Fortpflanzungsbiologie der Vögel,' reviewed, 157, 315, 469, 640.

Belcher, Charles F., review of his 'Birds of Nyassaland,' 288.
Bergtold, W. H., Bohemian Waxwings in Colorado, 432.
Berlepsch, Hans von, notice of his 'Twenty-second Review of Bird Conservation at Seebach,' 304.
Berlioz, J., notice of his 'La Vie des Oiseaux,' 629.
Bermuda, birds of, 511.
Bibliography, 319.
Bienteveo, 55.
Biological Survey, work of the, 229; poison in control operations of the, 477.
'Bird Banding,' reviewed, 154, 309, 463, 633.
Bird banding, 459, 461, 462, 538.
Bird houses, 461.
'Bird-Lore,' reviewed, 152, 308, 462, 632.
Birds of Paradise, 307.
Bittern, American, 113, 367, 572.
Least, 113, 367.
Blackbird, Eastern Red-winged, 238, 251, 371, 607.
Florida Red-winged, 252.
Orange-headed, 58.
Rusty, 125, 238, 241, 252.
Yellow-headed, 437.
Yellow-shouldered, 58.
Blincoe, Ben J., Knot in Montgomery Co., Ohio, 596.
Bluebird, 239, 370.
Bobolink, 61, 125, 134, 371.
Bobwhite, 236, 367, 444, 447, 573.
Florida, 250.
Bombycilla cedrorum, 238, 253, 375.
garrula, 432.
Bonassa umbellus, 374, 622.
Bond, James, notice of his 'A New Nuthatch from Grand Bahama,' 644.
Borneo, birds of, 148, 459, 460.
Botaurus lentiginosus, 367, 572.
Bowdish, B. S., obituary of Robert H. Southard, 325.
Bowen, W. Wedgwood, notice of his recent papers on African birds, 150, 459; notice of his 'Birds of the Gray Expedition to East Africa and Angola,' 455; notice of his 'South African Forms of Saxicola torquata,' 304; review of Lynes's 'Review of Cisticola' 291.
Brachyspiza capensis matutina, 57.
Branta c. canadensis, 280, 373.
c. hutchinsi, 259.
Brazil, birds of, 135, 138, 570.
Brimley, C. S., personal mention, 333.
'British Birds,' reviewed, 155, 313, 466, 636.
British Ornithologists' Club, 'Bulletin,' reviewed, 312, 466, 635.
Brodie Club, publications of the, 479.
Brodkorb, Pierce, Arkansas Kingbird in Florida, 270; notice of his 'Description of a New Warbler from Guadeloupe,' 305.
Brooks, Allan, the relationships of the American Magpies, 271.
Brooks, Earle A., notice of his 'List of the Birds of West Virginia,' 294.
Broun, Maurice, occurrence of Barrow's Golden-eye and Snow Geese in Berkshire Co., Mass., 413; some unusual birds for Berkshire Co., Mass., 130.
Bruce, James, Yellow-crowned Night Heron in Ohio, 593.
Bryant, H. C., report of the committee on bird protection, 91–94.
Bubo virginianus pacificus, 425.
v. pallescens, 620.
v. virginianus, 237.
Buceros, 600.
Bufflehead, 131, 374.
Bunting, Indigo, 120, 372.

Bunting, Painted, 443.
Snow, 275.
Varied, 63, 275.
Burma, birds of, 144.
Burns, Frank L., in re "Townsend's Oregon Tubinares," 106; personal mention, 333.
Burt, William H., notice of his 'Adaptative Modifications in the Woodpeckers,' 296.
Bushtit, California, 431.
Buteo borealis, 118, 237, 374, 573.
b. calurus, 619.
b. umbrinus, 250.
lineatus lineatus, 237.
platypterus, 118.
swainsoni, 619, 644.
Butler, A. L., notes on the Guacharo, 427.
Butler, Amos W., some bird records from Florida, 436.
Butorides virescens, 373.
Byrd, Dr. Hiram, obituary of, 323.

Calao, 600.
Calcarius lapponicus groenlandicus, 458.
l. lapponicus, 610.
Calidris canutus, 420, 596.
c. rufus, 261.
California, birds of, 142, 302, 460, 606, 620, 644.
Callocalia francica sororum, 315.
Campbell, Louis W., an Arkansas Kingbird and a Blue Grosbeak near Toledo, Ohio, 123; the Hooded Warbler nesting near Toledo, Ohio, 128.
Campephilus, 296.
Camptostoma imberbe ridgwayi, 307.
Campylorhamphus trochilirostris hellmayri, 138.
Canvasback, 374.
Capella delicata, 374.
Caprimulgus monticolus burmanicus, 466.
m. amoyensis, 466.
'Cardinal, The,' reviewed, 310, 633.
Cardinal, 127, 131, 238, 372, 574, 611.
Arizona, 63.
Gray-tailed, 63.
Red-crested, 566.
Cardinalis cardinalis cardinalis, 131, 238.
Carey, Henry Reginald, obituary of, 473.
Carpenter, George Irving, obituary of, 474.
Carriker, M. A., Jr., Euscarthmornis rufigularis, 122; notice of his 'New Birds from Peru and Ecuador,' 148; the cave birds of Trinidad, 186–194.
Cartwright, B. W., on Snowy Owl migration, 167.
Cartwright, Wm. J., Wilson's Warbler at sea, 129.
Casmerodius albus egretta, 113, 373.
egretta, 114, 260.
Cassowaries, 461.
Catamenia, 294.
Catbird, 121, 133, 370, 622.
Catharista urubu, 236.
Cathartes aura septentrionalis, 236, 374.
Catharus melpomene worthi, 307.
frantzi juancitonis, 307.
Catherodius, 306.
magnificus, 306.
Catherpes mexicanus meliphonus, 295.
Catoptrophorus semipalmatus, 421.
Centurus carolinus, 237.
Ceophloeus lineatus, 149.
Cepphus grylle, 591.
Certhia familiaris americana, 239, 574.
Certhilauda albofasciata boweni, 305.

Ceryle alcyon, 237, 601.
Ceylon, birds of, 144, 146,
Chaemepelia, 583.
passerina navassae, 148.
p. pallescens, 85.
Chaetura pelagica, 119, 251, 237, 368, 427.
Chamaea fasciata henshawi, 65.
Chamberlain, Chauncy Ward, obituary, 163.
Chamberlain, E. Burnham, see Sprunt, Alexander, Jr.
Chapman, Abel, review of his 'Memories of Fourscore Years and Two,' 293.
Chapman, Frank M., Columba squamosa at Key West, 116; Northern Crested Flycatcher in western Panama, 603.
Charadriiformes, 627.
Charadrius melodus, 261, 421.
semipalmatus, 421, 593.
Charitonetta albeola, 131, 374.
Chasen, F. N., and Kloss, C. Boden, notice of their 'New Race of Cyornis from the Java Sea,' 459; notice of their 'Collection of Birds from North Borneo,' 459.
Chat, Long-tailed, 283.
Yellow-breasted, 376.
Chaunoproctus ferreirostris, 381.
Chen caerulescens, 111, 335, 415.
hyperborea, 280, 335.
h. hyperborea, 111, 258.
h. nivalis, 414.
Chickadee, Black-capped, 622.
Carolina, 239, 254, 375, 574.
China, birds of, 306, 628, 629.
Chingolo, Brazilian, 57.
Chionophilos alpestris insularis, 441.
Chlidonias nigra surinamensis, 368.
Chlorochrysa calliparaea caeruleipectus, 149.
Chlorospingus olivaceus, 612.
ophthalmicus **dwighti**, 612.
Chlorura hypererythra microrhyncha, 315.
Chondestes grammacus grammacus, 62.
g. strigatus, 62.
Chordeiles minor minor, 251.
m. chapmani, 251, 602.
virginianus virginianus, 270, 574.
Christy, Bayard H., a fifty-year comparison, 365–378.
Chrysoccocyx c. intermedius, 313.
Chuck-will's-widow, 121.
Church, Cynthia, see Fry, Gladys G.
Circus aeruginosus, 458.
hudsonius, 117, 237, 599, 619.
Cisticola, 291.
melanura, 292.
angusticauda, 292.
alticola, 292.
incana, 292.
flavigularis, 292.
Clangula hyemalis, 131.
islandica, 414.
Clark, Austin H., white herons at Lincoln, Mass., 114; see also Friedmann, Herbert.
Cleptornis palauensis, 157.
Cobb, Stanley, attacks by Screech Owls, 119.
Coccyzus americanus, 375, 602.
a. americanus, 283.
Coker, Coit M., Hermit Thrush feeding on salamanders, 277.
Colaptes, 296.
auratus auratus, 237.
a. luteus, 133, 269.
chrysoides tenebrosus, 307.
Colinus virginianus, 367.
v. floridanus, 250.
v. virginianus, 236, 573.
Collins, Henry H., Jr., notice of his 'Field Marks of Birds Easily Confused,' 459.
Collocalia francica natunae, 157.

Colombia, birds of, 460.
Colonia, 294.
Colorado, birds of, 427, 432.
Columba flavirostris restricta, 307.
squamosa, 116.
Columbigallina, 583.
Colymbus auritus, 235, 248, 366.
holboelli, 559–563.
Comatibis eremita, 468.
Commons, Frank Watkins, obituary of, 474.
Compsothlypis americana americana, 64.
'Condor, The,' reviewed, 153, 308, 463, 633; notice of the 'Ten Year Index to,' 455.
Conkey, John H., Arkansas Kingbird in Massachusetts, 270; additional data on birds of the Boston Public Garden, 564–566.
Connecticut, birds of, 277, 511.
Conservation, 40, 47.
Conuropsis carolinensis, 438.
Conurus guarouba, 159.
Cook, G. M., obituary of G. L. Fordyce, 647.
Cooper Ornithological Club, sixth annual meeting of the, 480.
Coot, 236, 367, 573.
Cope, Edward Drinker, notice of Osborn's biography of, 456.
Coragyps urubu, 116; 117, 592.
Cormorant, 279.
Double-crested, 207, 373, 565, 589, 593.
Corvus brachyrhynchos, 370.
b. brachyrhynchos, 238, 270, 574.
b. pascuus, 251.
corax europhilus, 616.
ossifragus, 238.
Coryphospingus cucullatus araguira, 57.
pileatus, 57.
Cossypha heuglini euronota, 150.
Cotinga cayana, 158.
Court, E. J. see Ball, W. H.
Cowbird, 372.
Cabanis's Shiny, 54.
Dark Shiny, 54.
Dwarf, 60.
Eastern, 59.
Sagebrush, 60.
Shiny, 53.
Small Shiny, 54.
Red-eyed, 65.
Crabb, E. D., notice of his 'The Woodpeckers of Oklahoma,' 147.
Cramer, W. Stuart, Brewster's Warbler at Lancaster, 434; Lapland Longspur at Brigantine, N. J., 610; rare birds in Lancaster County, Pa., 593.
Crane, Sandhill, 594.
Crax globicera, 469.
Creeper, Brown, 239, 574.
Honey, 570.
Crevecoeur, F. F., personal mention, 333.
Crocethia alba, 195, 421.
Crosby, Maunsell Schieffelin, obituary, 320.
Crossbill, White-winged, 282.
Crotophaga ani, 250.
Crouch, J. E., personal mention, 166.
Crow, 238, 270, 370, 448, 574.
Fish, 238.
Florida, 251.
Cryptoglaux acadica acadica, 169, 266, 565.
Cuckoo, Asiatic, 269.
Himalayan, 269.
Yellow-billed, 120, 283, 375, 602.
Cuculus optatus, 269.
canorus bakeri, 269.
Curlew, Hudsonian, 249, 261, 421, 595.
Long-billed, 281, 418.
Cutting, C. Suydam, personal mention, 141.

Cyanocitta cristata cristata, 238, 574.
Cyanocompsa cyanea minor, 56.
cyanoides peruvianus, 149.
Cyanoderma melanothorax albigula, 157.
Cyanosylvia suecica, 298.
Cyclaris gujanensis albiventris, 149.
Cyornis rufigastra longipennis, 459.

Dafila acuta tzitzihoa, 236.
Dalmas, Raymond Comte de, obituary of, 163.
Danforth, Stuart T., notice of his 'Porto Rican Ornithological Records,' 305; notice of his 'Bird Records from the Virgin Islands,' 147.
'Danske Fugle,' noticed, 641.
Daptrius, 306.
Darlington, P. J., Jr., notice of his 'Notes on the Birds of Rio Frio, Colombia,' 460.
Davis, David E., Carolina Wren in Michigan, 276.
Davis, Malcolm, rearing young Nighthawks, 270; breeding of the Magpie in the Washington Zoo, 604.
Deane, Ruthven, abundance of the Passenger Pigeon in Pennsylvania in 1850, 264; American Egret and Little Blue Heron at Scarborough, Maine, 422.
Delacour, J. and Jabouille, P., notice of their 'Birds of Peracel Islands,' 629.
Delaware, birds of, 416.
Delaware Valley Ornithology Club, 333.
Dendrocitta rufa vernayi, 312.
formosa sarkari, 312.
Dendrocygna autumnalis, 258.
bicolor, 258.
Dendroica aestiva, 371.
a. morcomi, 64.
Dendroica auduboni, 435.
caerulescens caerulescens, 512–522.
c. cairnsi, 616.
cerulea, 64.
coronata, 133, 134, 238, 574.
discolor. 437.
d. collinsi, 438.
fusca, 616.
graciae, 64.
nigrescens halseii, 295.
occidentalis, 435.
palmarum hypochrysea, 254, 615.
p. palmarum, 133, 134, 614, 615.
pensylvanica, 616.
plumbea guadeloupensis, 305.
ruficapilla capitalis, 58.
vigorsii, 134, 239.
virens, 574, 616.
Denmark, birds of, 457.
deSchauensee, R. M., notice of his 'A New Bustard for South Africa,' 305; and 'Two New Birds from South Africa,' 305.
Diardigallus diardi, 158.
Dicaeum umbratile, 307.
Dickcissel, 120, 127, 372, 606.
Dickey, Donald R., notice of his 'A New Clapper Rail from Sonora,' 308; notice of his 'A New Clapper Rail from Sonora,' 460.
Diglossa, 294.
Diomedea fusca, 107.
Dise, Mary D., Little Blue Herons and Egrets at York, Pa., 259.
District of Columbia, birds of, 106, 211, 260, 610.
Dixon, Joseph, see Grinnell, Joseph.
Dolichonyx oryzivorus, 61, 125, 134, 371.
Dominican Republic, birds of, 451, 596.
Dove, Mexican Ground, 65.
Mourning, 133, 236, 265, 368, 622.

Dove, Western Mourning, 265.
Dovekie, 105.
Dowitcher, 420, 596.
Dryobates pubescens medius, 269.
p. pubescens, 237.
villosus villosus, 237, 565.
Duck, American Scaup, 257, 572.
Black, 113, 375.
Black-bellied Tree, 258.
Fulvous Tree, 258.
Lesser Scaup, 256, 257.
Red-legged Black, 236, 565.
Ruddy, 565.
Wood, 565, 572.
Ducks, shooting season for, 333.
Dumetella, 133, 370.
carolinensis, 440, 622.
DuMont, Philip A., summary of bird notes for Pinellas County, Florida, 246-255.
Dybowski, Benedict Ivanovich, obituary of, 328.
Dybowski, Jean, obituary of, 327.

Eagle, Bald, 367, 573.
Golden, 118, 267, 619.
Eaton, Richard J., breeding of the Black-backed Gull in Essex Co., Mass., 588; decrease of Hawks and Owls in northern New Jersey, 425.
Ecuador, birds of, 148.
Edwards, Helen M., rare birds from Alabama, 595.
Egret, 111, 113, 114, 259.
American, 373, 422, 593.
Snowy, 112, 113, 249.
Egretta thula thula, 113, 249.
Eider, 591, 615.
Elaenia albiceps, 55.
Elanoides forficatus forficatus, 250.
Elanus leucurus majusculus, 620.
Emberiza schoenicla, 298,
pallasi, 298.
schoeniclus, 157.
Emberizoides herbicola, 57.
Embernagra olivascens olivascens, 58.
platensis paraguayensis, 58.
Embryology, 306.
Emlen, Arthur C., obituary of Henry R. Carey, 473.
Empidonax minimus, 369.
trailli alnorum, 603.
t. brewsteri, 61.
t. trailli, 547–552.
virescens, 376.
'Emu, The,' reviewed, 156, 314, 467, 637.
England, birds of, 143, 451.
Eno, Henry Lane, obituary of, 648.
Eocrex primus, 463.
Ereunetes pusillus, 421.
mauri, 421.
Erismatura, 565.
Erolia bairdi, 458.
Erythropygia leucoptera permutata, 157.
Erythrura trichpa sanfordi, 315.
Essex County Ornithological Club, 'Bulletin' reviewed, 309.
Esten, Sidney R., bird weights of birds from notes of William van-Gorder, 572–574.
Eubucco richardsoni coccineus, 149.
Euphagus carolinus, 125, 238, 252.
Eupodotys alleni, 305.
Euscarthmornis margaritaceiventer, 149.
Euscarthmus rufigularis, 122.
Evans, Victor Justice, obituary of, 326.
Everett, Edward Addison, obituary of, 475.

Falco columbarius, 266.
c. columbarius, 250.
c. subaesalon, 458.
gyrfalco, 465.
rusticolus candicans, 458.
r. holboelli, 458.
r. rusticolus, 458.

Falco rusticolus islandus, 458.
r. obsoletus, 458.
sparverius, 118, 250, 367.
s. phalaena, 620.
s. sparverius, 237, 573.
Falcon, Pergrine, 598.
Farley, Frank L., nesting of the Greater Yellow-legs in Alberta, 261.
Finch, Argentine Red-crested, 57.
Azara's Ground, 57.
Holt's Saffron, 57.
Olive ground, 58.
Paraguayan Ground, 58.
Pileated, 57.
Purple, 279.
Saffron, 57.
Screaming, 57.
White-breasted Warbling, 57.
Yellow-bellied Ground, 57.
Finland, birds of, 145.
Fisher, A. K., personal mention, 649.
Florida, birds of, 114, 116, 201, 211, 212, 246, 259, 270, 332, 423, 428, 436, 442, 462, 595.
Florida caerulea, 113, 114, 259.
Flycatcher, Acadian, 376.
Alder, 120, 547–552.
Banded Brown, 55.
Crested, 60, 120, 123, 375, 603.
Derby, 123.
D'Orbigny's Crested, 55.
Least, 369.
Olive-sided, 120, 282.
Scissor-tailed, 123, 428.
Tody, 497.
Traill's, 61, 603.
Flicker, 133, 237, 311, 369.
'Flicker, The,' reviewed, 634.
Food habits, 307, 425.
Ford, Edward R., note on Kirtland's Warbler, 276.
Fordyce, George L., obituary of, 647.
Formenkreis theory, 286.
Fossil birds, 462.
Foudia sakalava minor, 468.
Fratercula arctica arctica, 591.
Freer, Ruskin S., the Dickcissel in Virginia, 127.
Friedmann, Herbert, additions to the list of birds known to be parasitized by the Cowbirds, 52–65; the Mourning Dove in Alaska, 265; obituary of Jean Dybowski, 327; notice of his recent papers on African birds, 150; notice of his 'Geographic Variations of Neocichla gutturalis,' 305; notice of his 'Birds Collected in the Belgian Congo,' 460; and 'Social Parasitism in Birds,' 460.
Friedmann, Herbert and Clark, Austin H., nesting records of sparrows in the vicinity of Washington, 610.
Friedmann, Herbert and Riley, J. H., the genus Cuculus in North America, 269.
Fringilla mortoni, 108.
Fry, Gladys Gordon, Cynthia Dryden, Kuser, Cynthia Church and Laidlaw, Williams, Red Phalarope in Ocean County, N. J., 597.
Fuertes, Louis A., notice of his 'Abyssinian Birds and Mammals Painted from Life,' 141.
Fulica americana, 236, 367, 573.
Fuller, Arthur B. and Bole, B. P., Jr., notice of their 'Observations on Some Wyoming Birds,' 146.
Furnarius rufus rufus, 54.

Galapagos, birds of the, 624, 625.
Gallinago delicata, 236, 565, 573.
Gallinula chloropus cachinnans, 367.
Gallinule, Florida, 113, 367.
Purple, 249.
Game protection, 444, 446, 448.
Gannet, 109, 256, 442.
Garrison, Lura P., see Pickens, A. L.

Garrodia nereis chubbi, 313.
Garrulax ferrarius, 307.
Garrulus canadensis, 617.
Gavia adamsi, 105.
arctica, 105.
immer, 105, 373, 572.
stellata, 131, 105.
Geese, shooting season for, 334.
Geiser, S. W., notice of his 'Audubon in Texas,' 305.
Gennaeus lewisi, 158.
Geocichla terrestris, 381.
Geococcyx californicus, 150.
Geomalia heinrichi, 315.
Georgia, birds of, 118, 212, 256, 268, 279, 435, 511, 616.
Geothlypis aequinoctialis velatus, 56.
trichas, 371.
t. chryseola, 153.
t. sinuosa, 65.
'Gerfaut, Le,' reviewed, 316, 641.
Germany, birds of, 151.
Gerygone arfakiana, 157.
rufescens, 157.
Glareola pratincola boweni, 312.
Glaucionetta clangula americana, 565.
Gnatcatcher, Black-tailed, 65.
Blue-gray, 277, 371.
Godwit, Hudsonian, 596.
Marbled, 261, 281.
Golden-eye, American, 565.
Barrow's, 413.
Goldfinch, 238, 273, 372.
Green-backed, 61.
Gorbunoff, G., notice of his 'Saugetie und Vogelfauna Nowaja Semlja,' 150.
Goose, Blue, 111, 335, 415.
Canada, 280, 373.
Greater Snow, 414.
Hutchins', 259.
Lesser Snow, 111, 258, 335.
Snow, 280.
Goshawk, 454, 618.
Goshawk, Western, 618.
Grackle, Boat-tailed, 431, 607, 609.
Bronzed, 61, 238, 245, 372.
Florida, 252.
Purple, 566.
Grallaria berlepschi yessupi, 149.
Grand Bahama, birds of, 644.
Grebe, Holboell's, 559-563, 617.
Horned, 235, 248, 366.
Pied-billed, 235, 279, 367.
Greene, Earle R., Golden Eagle captured in Georgia, 118; a late spring record of Lesser Scaup Duck in Georgia, 256; bird life on Brasstown Bald, Ga., 616.
Greenland, birds of, 457.
Greenway, J., Jr., a Jefferson letter of historical and ornithological interest, 175–180.
Grimes, S. A., Nighthawk moving her eggs, 602.
Grinnell, Joseph, some angles in the problem of bird migration, 22–32.
Grinnell, Joseph, Dixon, Joseph and Linsdale, Jean M., review of their 'Vertebrates of the Mount Lassen Region,' 142.
Griscom, Ludlow, obituary of Maunsell S. Crosby, 320; notice of his 'Studies from the Dwight Collection of Guatemala Birds. III,' 305.
Groebbels, Franz, notice of his papers on flight, physiology, etc. of birds, 305, 306.
Gromme, Owen J., Golden Plover in the Lake Winnebago Area, 416.
Grosbeak, Blue, 123, 253.
Evening, 618.
Pine, 126, 132.
Rose-breasted, 616.
Venezuelan Blue, 56.
Western Blue, 63.
Gross, Alfred O., Snowy Owl migration 1930–31, 501–511; notice of his 'Progress Report of the

Wisconsin Prairie Chicken Investigation, 296.
Grosvenor, Gilbert, Egrets at Cape Breton Island, N. S., 111.
Grote, Hermann, notice of his 'Wintering of Palaearctic Birds in Africa,' 147.
Grouse, Ruffed, 279, 374, 622.
Grus mexicana, 594.
Guacharo, 186, 427.
Guadeloupe, birds of, 305.
Guara alba, 248.
Guatemala, birds of, 305.
Guillemot, Black, 591.
Brunnich's, 245.
Guiraca caerulea, 123.
c. caerulea, 253.
c. lazula, 63.
'Gull, The,' 310.
Gull, American Herring, 572.
Black-backed, 244, 588, 589.
Bonaparte's, 248.
Glaucous, 435.
Herring, 591.
Laughing, 437, 591.
Gutsell, James S., Sooty Shearwater and Audubon's Shearwater in North Carolina, 105.
Gyldenstolpe, Nils, notice of his recent papers on Ecuador birds, 149.
Gymnostenops montezuma, 496.

Hachisuka, Masauji, review of his 'Birds of the Philippine Islands,' 454.
Haematopus palliatus, 437.
Haiti, birds of, 148, 308, 451, 644.
Halcyon albiventris prentisgrayi, 456.
chloris, 461.
concreta borneana, 459.
Haldeman, Doris W., a study of the Eastern Song Sparrow, 385–406.
Haliaeetus leucocephalus, 367.
l. leucocephalus, 573.
Handley, Charles O., the Black Vulture in Greenbrier County, W. Va., 598.
Harding, Katherine C., nesting habits of the Black-throated Blue Warbler, 512–522.
Harelda hyemalis, 593.
Harper, Francis, notice of his 'Faunal Areas of Athabasca etc.,' 306.
Hartert, Ernst, notice of his 'On a Collection of Birds Made by Dr. Ernst Mayr in northern New Guinea,' 295; notice of his 'Types of Birds in the Tring Museum,' 460.
Hawk, Broad-winged, 120, 426.
Cooper's, 374, 426, 454, 619.
Desert Sparrow, 620.
Duck, 120, 426.
Florida Red-tailed, 250.
Marsh, 117, 120, 237, 599, 619.
Pigeon, 250, 266, 426.
Red-shouldered, 237, 426.
Red-tailed, 237, 374, 426, 573.
Rough-legged, 426, 573.
Sharp-shinned, 125, 237, 265, 374, 426, 619.
Sparrow, 237, 250, 367, 426, 573.
Swainson's, 617, 619, 644.
Western Red-tailed, 619.
Hawks, destruction of, 334.
Heath Hen, 480.
Heinrichia calligyna, 315.
Heleodytes albicilius, 52.
brunneicapillus purus, 307.
Helmayr, C. E., obituary of Raymond Comte deDalmas, 163; obituary of Miss Emilie Snethlage, 161.
Henderson, A. D., the Long-billed Curlew at Belvidere Alberta, 418.
Henry, G. M., notice of his illustrations of the Birds of Ceylon, 146.

Herman, W. C., note on the Spoon bill in Florida, 332.
Herodias egretta, 593.
'Heron, The,' reviewed, 464.
Heron, Black-crowned, Night, 375, 567, 573, 592.
Great Blue, 112, 113, 236, 259, 279, 367, 567, 573, 592.
Green, 113.
Little Blue, 112, 113, 114, 115, 259, 422.
Night, 306.
Yellow-crowned Night, 593.
Hesperiphona vespertina, 618.
Heterotrogon vittatum keniensis, 150.
Hierophasis edwardsi, 158.
Higgins, Earl T., Snowy Owl on the New Jersey coast, 267.
Hill, Louis Webb see Phillips, John C.
Hine, James Stuart, obituary of, 323.
Hirundo erythrogaster, 370.
rustica erythrogaster, 64.
Holt, Ernest G., review of Williams' 'Trinidad Birds,' 449, 570; A new Honey Creeper from the Amazon, 570.
Honduras, birds of, 307, 481.
Horizopus, 294.
Hornaday, William T., review of his 'Thirty Years war for Wild Life,' 448.
Hortling, Ivar, notice of his 'Ornitologisk Handbok,' 145.
Howell, Arthur, H., obituary of Dr. Hiram Byrd, 323.
Huber, Wharton, European Widgeon in Georgia, 256; Hutchins's Goose in Maryland, 259.
Hudson Bay, birds of, 335, 461.
Huey, Laurence M., the occurrence of Myiarchus cinerascens inquietus in Lower California, 429; Icterus pustulatus a new bird to the A. O. U. Check-List, 606; notes on two birds from San Diego County, Calif., 620; notice of his 'On the Marsh Sparrows of Southern and Lower California,' 460.
Hummingbird, Rieffer's, 481.
Ruby-throated, 532–537, 574.
Hunt, Chreswell J., notes on the winter birds of central Arkansas, 235–239.
Hyde, A. Sydney, review of Freiberger on bird conservation in German forests, 151.
Hydrochelidon nigra surinamensis, 572.
Hydroprogne caspia imperator, 248.
Hylocichla fuscescens fuscescens, 616.
guttata pallasi, 239.
mustelina, 370, 574.
ustulata ustulata, 435.
Hylophylax naevia intermedia, 149.
n. yessupi, 149.
naevioides, 428.
n. capnitis, 428.
n. subsimilis, 428.
poecilonota obscurior, 149.
Hypocnemis cantator saturatus, 149.
Hypotriorchus subbuteo distinguendus, 307.
s. planicola, 307.

'Ibis, The,' reviewed, 155, 311, 464, 634.
Ibis, White, 115, 248.
Wood, 249.
Ibycter, 306.
Icteria virens, 376.
v. longicauda, 283.
Icterus galbula, 372.
gularis, 305.
pustulatus, 65, 606.
sclateri, 305.
spurius, 283, 372, 574, 606.
Ijams, H. P., two interesting notes from east Tennessee, 267.

Illinois, birds of, 258, 298, 593.
Illinois Audubon Society, notice of 'Bulletin,' 298.
Incana, 292.
India, 144.
Indiana Audubon Society, review of its 'Year Book,' 628.
Ingersoll, A. M., personal mention, 333.
Ionornis martinicus, 249.
Iowa, birds of, 644.
'Iowa Bird-Life,' reviewed, 464, 634.
Iowa Ornithologists' Union, 'Bulletin,' reviewed, 311.
Iridoprocne bicolor, 369.
Ixobrychus exilis, 367.
e. pullus, 307.

Jabouille, P., see Delacour, J.
Jacana, 294.
Jackson, C. F., and Allan, Philip F., experiment in recolonization of the Common Tern (Sterna hirundo), 17–21.
Japan, birds of, 306, 626.
Jay, Blue, 238, 272, 574.
California, 431.
Canada, 131.
Florida, 251.
Johnson, Archibald, notes from Stutsman County, North Dakota, 283.
Jourdain, F. C. R., review of his translation of Kleinschmidt's 'The Formenkreis Theory,' 286; personal mention, 331.
'Journal für Ornithologie,' reviewed, 157, 315, 469, 639.
Junco annectens, 611.
hyemalis carolinensis, 616.
h. hyemalis, 134, 238, 574.
mearnsi, 611, 620.
oreganus shufeldti, 274.
o. couesi, 274.
pink-sided, 621.
Junco, Carolina, 616.
Junco, Shufeldt's, 274.
Slate-colored, 134, 238, 574.

Kassoy, Irving, Kuerzi, John and Richard, notes on breeding birds of Orange County, N. Y., 277.
Kennard, F. H., obituary of Chauncy W. Chamberlain, 163.
Kernel-eater, Gray, 57.
Killdeer, 113, 236, 282, 374, 417, 421, 566, 596.
Kingbird, 120, 245, 369.
Arkansas, 123, 270, 603.
Gray, 251.
Kingfisher, 117.
Belted, 120, 237, 368, 601.
Kinglet, Golden-crowned, 239, 283.
Ruby-crowned, 239.
Kinnear, N. B., see Lowe, P. R.
Kite, Swallow-tailed, 115, 250.
Kleinschmidt, O., review of his 'The Formenkreis Theory,' 286.
Kloss, C. Boden, notice of his 'Account of the Bornean Birds in the Zoological Museum, Buitenzorg,' 460; see also Chasen, F. N. and Robinson, H. C.
Knipolegus cyanirostris, 55.
Knopfli, W. see vonBurg, G.
Knot, 131, 261, 420, 596.
'Kocsag,' reviewed, 158, 642.
Koslova, E. V., notice of her 'Birds of Trans-Baikalia and Mongolia,' 297.
Kuerzi, John F., notes on the occurrence of Ajaia ajaja and some other species in Florida, 114; on the status of the Gannet in the New York City region, 256; see also Kassoy, Irving.
Kuerzi, Richard, see Kassoy, Irving.
Kuroda, Nagamichi, notice of his 'Geographic Distribution of the Birds of Japan,' 306; notice of his Watase's Line in the Faunal Distribution in Southern Japan,' 644.

Kuser, Cynthia Dryden, see Fry, Gladys.

L'Hommedieu, James Frank, obituary, 164.
'L'Oiseau,' reviewed, 156, 317, 468, 638.
La Touche, J. D. D., review of his 'Handbook of the Birds of Eastern China,' 628.
Lagopus mutus albus, 617.
leucurus, 617.
Lane, H. Wallace, Varied Bunting in New Mexico, 275.
Lanius borealis, 132.
ludovicianus ludovicianus, 574.
l. migrans, 238, 371.
Lanivireo flavifrons, 253.
solitarius alticola, 616.
s. plumbeus, 64.
s. solitarius, 128, 253.
Lark, Horned, 242.
Prairie Horned, 238.
Larson, Leigh M., notice of his 'Osteology of the Roadrunner,' 150.
Larus argentatus, 591.
a. smithsonianus, 572.
atricilla, 437, 591.
hyperboreus, 435.
marinus, 588, 589.
melanocephalus relictus, 630.
philadelphia, 248.
ridibundus ridibundus, 160.
Laubmann, Alfred, notice of his 'Birds of the Gran Chaco Expedition', 138.
Lefevre, Rufus H., notice of his 'Summer Birds of Hong Kong,' 306.
Leffingwell, Mrs. Dana J., Bobolink in western Montana, 125.
Leioptila desgodinsi engelbachi, 317.
Leopold, Aldo, 446; review of his 'Game Survey of the North-Central States,' 446.
Lepidopyga duchassaingi, 460.
lilliae, 460.
Leptotila plumbeiceps notius, 306.
Lewis, John B., behavior of Rusty Blackbird, 125; White-throated Sparrow in Virginia in June, 274.
Lewis, Harrison F., additional information concerning the Double-crested Cormorant, 207–214; notes on the Starling in the northern part of its North American range, 605.
Liberia, birds of, 295.
Lichenops perspicillata andina, 55.
Limnodromus griseus griseus, 420.
Limosa fedoa, 261.
haemastica, 596.
Lincoln, Frederick L., some causes of mortality among birds, 538, 546; personal mention, 334, 480; see also Phillips, John C. and Wetmore, A.
Linsdale, Jean M., see Grinnell, Joseph.
Little, Elbert L., Jr., see Ortenburger, A. J.
Lobipes lobatus, 282.
Loboparadisea sericea aurora, 157.
Logier, E. B. S. see Snyder, L. L.
Longspur, Lapland, 610.
Lönnberg, Einar, notice of his 'Birds from South Gobi,' 630; notice of his 'A Remarkable Gull from the Gobi Desert,' 630.
Loon, 105, 373, 572.
Red-throated, 131.
Lophoceros nasutus, 313.
williaminae, 305.
Lophodytes cucullatus, 236.
Lophorina superba niedda, 157.
s. connectens, 157.
Low, G. Carmichael, review of the second edition of his 'Literature of the Charadriiformes,' 627.
Lowe, P. R., notice of his 'Broadbills in Africa,' 631.

Lowe, P. R. and Kinnear, N. B., notice of their 'Birds of the British Antarctic Expedition,' 141.
Lower California, birds of, 429, 460.
Loxia leucoptera, 282.
Loxigilla violacea parishi, 308.
Lycocorax pyrrhopterus, 312.
Lyle, Robert B., nesting of the Black Vulture in Washington County, Tennessee, 598.
Lynes, H., review of his 'Review of the genus Cisticola,' 291.

MacAtee, W. L., obituary of James S. Hine, 323; notice of Swenk's paper on food of the Ring-neck Pheasant, 151; notice of his 'Local Bird Refuges,' 461.
Machetornis rixosa rixosa, 55.
Madison, Herbert L., personal mention, 331.
Magdalene Islands, birds of, 240.
Magpie, 271, 604.
  American, 617.
  Yellow-billed, 271.
Mailliard, Joseph, notice of his 'Handbook of the Birds of Golden Gate Park,' 302.
Maine, birds of, 422, 511, 589.
Malacopteron magnum saba, 459.
Mallard, 236, 373, 414, 572.
Manigault, Edward, second occurrence of the Snow Bunting in South Carolina, 275.
Manitoba, birds of, 208, 511.
Man-o-war-bird, 595.
Manuel, C. G., bird predators of the Tern, 592.
Mareca americana, 572, 615.
  penelope, 256.
Marsh, Thompson, the Chimney Swift in Colorado, 427.
Marshbird, Yellow-headed, 58.
  Red-headed, 58.
Martin, Purple, 238, 279, 370.
Maryland, birds of, 121, 201, 259, 267, 511, 604.
Massachusetts, birds of, 126, 130, 160, 211, 215, 270, 274, 424, 511, 564, 588, 599.
Mathews, G. M., personal mention, 331.
May, John B., more Audubon copperplates, 284.
Mayr, Ernst, the generic name Calao, 600; report on his New Guinea collections, 295; notice of his 'Birds Collected During the Whitney South Sea Expedition XII,' 461; personal mention, 331.
Mayr, Ernst, and Meise, Wilhelm, review of their 'Theoretisches zur Geschichte des Vogelzuges,' 302.
Meadowlark, 238, 245, 371, 574.
  Western, 431.
Megaceryle, 465.
  alcyon, 368.
Megaquiscalus major, 431.
Megazosterops, 157.
Meinertzhagen, R., review of his 'Nicoll's Birds of Egypt,' 289.
Meise, Wilhelm, see Mayr, Ernst.
Melanerpes erythrocephalus, 122, 237, 250, 369.
Meleagris gallopavo, 374.
Melospiza georgiana, 238.
  lincolni lincolni, 62.
  melodia melodia, 238, 373, 385.
Merganser, 367.
  American, 236.
  Hooded, 236.
  Red-breasted, 374.
Mergus americanus, 236.
  merganser americanus, 367.
  serrator, 374.
  serrator major, 458.
Merriam, C. Hart, personal mention, 649.
Mershon, W. B., note on the Passenger Pigeon, 116.

Metcalf, Franklin P., notice of his 'Wild Duck Foods of North Dakota Lakes,' 461.
Mexico, birds of, 307, 454.
Michigan, birds of, 109, 114, 116, 126, 131, 258, 276, 414, 424, 461, 511, 612, 613, 614, 616, 618.
Micklem, H. M., personal mention, 333.
Microchera, 316.
Micropalama himantopus, 282, 417, 420.
Microrhopias quixensis nigriventris, 149.
'Migrant, The,' reviewed, 311, 464, 634.
Migration, 22–32, 298, 302.
Migratory Bird Regulations, 333.
Millais, John Guille, obituary of, 472.
Mills, Enos A., review of his 'Bird Memories of the Rockies,' 627.
Mimus gilvus gilvus, 56.
polyglottos, 239, 574.
Minnesota, birds of, 435, 511.
Mitchell, Catharine A., Roseate Spoonbills in Florida, 259.
Mitua mitu, 469.
Mixornis gularis argentea, 459.
Mockingbird, 130, 239, 574.
Graceful, 56.
Molothrus ater artemisiae, 60.
a. ater, 59, 372.
a. obscurus, 60.
bonariensis, 52.
b. cabinisii, 54.
b. melanogyna, 54.
b. minimus, 54.
Mongolia, birds of, 148, 297.
Montana, birds of, 125.
Moore, John Alexander, Short-eared Owl in Virginia, 425.
Moosebird, 617.
Morehouse, Beaumont J., Connecticut notes, 277.
Moris bassana, 442.
vagabundus, 148.
Mortality, 538.
Moseley, E. L., personal mention, 333.
Motacilla alba alba, 458.
Moult, 105.
Mouseley, Henry, correction, 334; a study of the home life of the Alder Flycatcher, 547–552.
Moyer, John William, Black-bellied and Fulvous Tree Ducks in Illinois, 258.
Murray, J. J., the voice of the Blue-winged Teal and of the Shoveller, 110; the Black Vulture in the Tennessee mountains, 117; a late fall occurrence of the Northern Water-Thrush, 129; Nashville Warbler at Lexington, Va., 276; Pectoral Sandpiper at Lexington, Virginia, 418.
'Murrelet, The,' reviewed, 154.
Muscivora forficata, 428.
Musophaga violacea, 158.
Musselman, T. E., the winter range of the Chimney Swift, 119.
Mycteria americana, 249.
Myiarchus cinerascens inquietus, 429.
c. nuttingi, 430.
crinitus, 60, 120.
crinitus boreus, 375, 603.
Myiochanes, 294.
emleni, 307.
richardsonii richardsonii, 60.
virens, 269, 622.
Myiomoira macrocephala enderbyi, 313.
Myiophobus fasciatus fasciatus, 55.
Myiozetetes similis primulus, 307.
Myrmoderus hemimelaenus spodiogaster, 149.
Myrmotherula australis soderstromi, 149.
longicaudata pseudoaustralis, 149.
surinamensis, 149.

Nannus troglodytes hiemalis, 284.
t. stevensoni, 150.
Napothera brevicaudata proxima, 317.
Naumberg, Elsie M. B., review of her 'The Birds of Matto Grosso, Brazil,' 135; the Senkenberg Museum, Frankfort-on-Main, Germany, 379-384.
Nebraska, birds of, 151, 307.
Neocichla gutturalis angustus, 305.
Nesillas typica monticola, 313.
Nettion carolinensis, 572.
New Brunswick, birds of, 511.
New Guinea, birds of, 295, 461.
New Hampshire, birds of, 118, 512, 615.
New Jersey, birds of, 116, 128, 201, 334, 418, 425, 434, 511, 597, 610.
New Mexico, birds of, 275, 294.
New York, birds of, 201, 211, 256, 277, 453, 511, 567, 606.
New Zealand, birds of, 300.
Newfoundland, birds of, 511.
Newtonia archboldi, 468.
Nice, Margaret M., notes on the twilight songs of the Scissor-tailed and Crested Flycatchers, 123; a study of two nests of the Ovenbird, 215–228; notice of her 'Birds of the Campus of Oklahoma University,' 306; review of her 'Birds of Oklahoma,' 452.
Nichols, J. C. M., review of his 'Birds of Marsh and More,' 451.
Nichols, J. T., notes on the flocking of shore birds, 181–185; review of Mayr and Meise's 'History of Bird Migration,' 302.
Nicholson, Donald J., Scissor-tailed Flycatcher, a rare Florida winter resident, 428.
Nicoll, Michael J., review of his 'Birds of Egypt,' 289.
Nighthawk, 251, 270, 574.
Florida, 251, 602.
Norris, Joseph Parker, obituary of, 329.
'Norsk Ornithologiske Tidsskrift,' reviewed, 642.
North Carolina, birds of, 105, 111, 201, 212, 273, 511, 592.
North Dakota, birds of, 283, 511.
Norton, Arthur H. and Allen, Robert P., nesting of the Black-backed Gull and other birds in Maine, 589.
Nova Scotia, birds of, 111, 240, 511.
Novaya Zemlya, birds of, 150.
Numenius americanus, 281, 418.
hudsonicus, 261, 421, 595.
Nuthatch, Brown-headed, 254.
White-breasted, 239, 370.
Nuttalornis borealis, 282, 294.
majorinus, 294.
Nyassaland, birds of, 288.
Nyctanassa violacea, 593.
Nyctea nyctea, 267, 268, 424, 501–511, 592.
scandiaca, 465.
Nycticorax caledo icus, 306.
cyanocephalus, 306.
nycticorax hoactli, 306.
naevius, 375, 567, 573, 592.
n. tayazuguira, 306.
Nyroca affinis, 236, 256, 367, 257.
americana, 373, 572.
marila, 572.
m. nearctica, 257.
valisisneria, 374.

Oberholser, report of the Ridgway memorial committee, 95; Ammospiza caudacuta diversa, a valid race, 610; notice of recent papers by, 149; notice of his 'Notes on a Collection of Birds from Arizona and New Mexico,' 294.
Oceanodroma leucorhoa, 106.
l. leucorhoa, 592.
Ochthoeca, 294.
Ogburn, Charlton, Jr., late nesting

of the Goldfinch in North Carolina, 273.
Ohio, birds of, 112, 123, 128, 257, 365, 431, 435, 511, 593, 596.
Oidemia americana, 258, 282.
Oklahoma, birds of, 147, 306, 452.
Old Squaw, 131, 593.
Oliver, W. R. B., notice of his 'New Zealand Birds,' 300.
Olivier, J., a seventeenth century representation of the Cardinal, 611.
Olsen, Humphrey A., see Olsen, Richard E.
Olsen, Richard E., Olsen, Humphrey A., and Walkinshaw, Lawrence H., Snowy Owls in southern Michigan, 424; Palm Warbler breeding in Michigan, 614.
Ontario, birds of, 146, 211, 511, 605.
'Oologist, The,' reviewed, 154, 309, 464, 634.
'Oologists' Record, The,' reviewed, 155, 313, 467, 636.
Oporornis philadelphia, 64.
Orchilus rufipes, 149.
Oregon, birds of, 106.
Oreocincla griseiceps, 155.
Oreopelia lawrencii lentipes, 306.
Oreoscoptes montanus, 283.
'Orgaan der Club van Nederlandsche Vogelkundigen,' reviewed, 158.
Oriole, Baltimore, 372.
Orchard, 120, 279, 283, 372, 574, 606.
Scarlet-headed, 65, 606.
'Ornis Fennica,' reviewed, 316, 642.
Ornismya kingii, 294.
Ornithological articles in other Journals, 159, 317, 459, 643.
'Ornithologische Beobachter, Der,' reviewed, 158, 316, 641.
'Ornithologische Monatsberichte,' reviewed, 157, 315, 469, 639.
Oropendola, Montezuma's, 496.
Ortenburger, A. J., and Little, Elbert L., Jr., notice of their 'Notes on a Collection of Birds from Western Oklahoma,' 306.
Osborn, Henry Fairfield, review of his 'Cope: Master Naturalist,' 456.
Osprey, 619.
Otocoris alpestris insularis, 441.
a. praticola, 238.
Otus asio asio, 237, 573.
a. cinerascens, 430.
a. naevius, 268.
Ovenbird, 129, 215, 574.
Rufous, 54.
Owl, Barn, 237, 438, 573, 599.
Barred, 237.
Florida Burrowing, 644.
Great Horned, 237.
Pacific Great Horned, 425.
Richardson's, 245.
Saw-whet, 169, 266, 565.
Screech, 119, 237, 245, 368, 573.
Short-eared, 134, 282, 425, 573.
Snowy, 245, 267, 268, 424, 454, 501–511.
Western Horned, 620.
Owl killing in Europe, 480.
Oxyechus vociferus, 236, 282, 374, 421, 566.
Oyster-catcher, 437, 595.

Pachycephalopsis hattamensis axillaris, 313.
Pagolla wilsonia, 644.
Painterius, 149.
Palaeorallus troxelli, 463.
Palaeornis derbyana, 159.
Palmer, T. S., the forty-eighth stated meeting of the American Ornithologists' Union, 66–80; report of the secretary, 81–86; report of the committee on biography and bibliography, 87–90; obituary of John Mallory Bates,

162; Audubon's Shearwater in the United States, 198–206; obituaries of Carlos Avery, 322; Harry Wolstenholme, 326; Victor Justice Evans, 326; B. I. Dybowski, 328; Clement Walker Andrews, 329; on the publication of Otocoris alpestris insularis, 441; obituaries of J. G. Millais, 372; and George I. Carpenter, 474; D. W. Shea and Henry L. Eno, 648; review of 'Uchida's 'Birds of Mt. Fuji,' 626; personal mention, 480.
Panama, birds of, 306, 481, 603.
Pandion haliaetus carolinensis, 619.
Paradisaea apoda, 312.
Parasites, intestinal, 265.
Paroaria cucullata, 566.
Paroquet, Carolina, 438.
Parotia sefilata, 315.
Parrakeet, Carolina, 383.
Parrot, Kea, 300.
Passer domesticus, 372.
Passerculus beldingi, 460.
princeps, 615.
rostratus, 308.
r. anulus, 295, 460.
sandwichensis alaudinus, 295.
s. atratus, 307.
s. anthinus, 295.
s. beldingi, 295.
s. brooksi, 295.
s. nevadensis, 295.
s. savanna, 61, 238, 376.
Passerella iliaca iliaca, 238, 574.
i. schistacea, 63.
Passerherbulus henslowi henslowi, 618.
h. occidentalis, 238.
h. sussurans, 62, 610.
maritimus fisheri, 123.
m. howelli, 123.
m. peninsulae, 252.
Passerina ciris ciris, 443.
cyanea, 372.
versicolor versicolor, 63, 275.
Pearson, T. G., on game conservation, 166.
Pelecanus erythrorhynchos, 373, 437.
fuscus, 107.
occidentalis occidentalis, 413, 435.
Pelican Brown, 413, 436.
White, 373, 437.
Pelidna alpina sakhalina, 417, 593.
Pennock, Charles J., on the color of the iris and other characteristics of the Boat-tailed Grackle, 607.
Pennsylvania, birds of, 110, 113, 137, 259, 264, 415, 434, 511, 613.
Penthestes atricapillus, 622.
carolinensis carolinensis, 239, 254, 375, 574.
c. impiger, 254.
Perine, Keble B., Marsh Hawk vs. Kingfisher, 117.
Perisoreus c. canadensis, 131.
Perrygo, W. M., see Wetmore, Alexander.
Peru, birds of, 122, 148, 294.
Peters, Harold S., Abert's Towhee, a new bird for Texas, 274.
Peters, James L., an account of the Yellow-green Vireo, 575–587; notice of his 'Additional Notes on the Birds of Almirante Bay, Panama,' 306; notice of his 'Notes on Some Night Herons,' 306; and his 'Remarks on Hawks hitherto included in Ibycter,' 306; notice of his proposed Check-List of the Birds of the World, 332; notice of his 'Review of Picus lineatus,' 149.
Petrel, Leach's, 592.
Petrochelidon albifrons albifrons, 63, 370.
Petrophila rufocinerea tenuis, 150.
Peucaea cassini, 62.
Pewee, Western Wood, 60.
Wood, 120, 369, 622.

Phaeopus hudsonicus, 249.
Phainopepla, 64.
nitens, 64.
Phalacrocorax auritus auritus, 207, 373, 565, 589, 593.
carbo, 279.
Phalarope, Northern, 282.
Red, 597.
Wilson's, 417, 420, 593, 597.
Phalaropus fulicarius, 597.
Phalcobaenus, 306.
Phasianus colchicus torquatus, 375.
Pheasant, Ring-necked, 151, 307, 375.
Pheugopedius felix pallidus, 65.
f. sonorae, 307.
Philippines, birds of the, 454.
Phillips, John C., naturalists, nature lovers, and sportsmen, 40–46; review of his 'American Game Mammals and Birds,' 138.
Phillips, John C., and Hill, Lewis Webb, review of their 'Classics of the American Shooting Field,' 140.
Phillips, John C. and Lincoln, F. C., review of their 'American Waterfowl,' 139.
Philohela minor, 368.
Phloeotomus pileatus pileatus, 237.
Phoebastria nigripes reischekia, 313.
Phoebe, 237, 369, 574.
Say's, 60.
Phonygammus keraudreni, 312.
Physiology, 305.
Piaya cayana stirtoni, 307.
c. extima, 307.
Pica pica hudsonia, 272, 604, 617.
nuttalli, 272.
Pickens, A. L. and Garrison, Lura P., a two-year record of the Ruby-throat's visits to a garden, 532–537.
Picumnis grandis, 149.
Pigeon, Passenger, 116, 264, 383.
Pike, Eugene R., Roseate Spoonbills in Florida, 423; notes on birds of southern Florida, 595.
Pinicola enucleator leucura, 126, 132.
Pintail, 236.
Pipilo aberti, 63, 274.
erythrophthalmus 253, 375.
e. erythophalmus, 238.
maculatus arcticus, 63.
m. megalonyx, 63.
rutilus, 65.
Pipit, 243, 254.
Pipramorpha macconnelli peruana, 149.
Piranga erythromelas, 127, 616.
flava saira, 56.
ludoviciana, 130.
Pisobia bairdi, 260, 442.
alpina sakhalina, 420.
fuscicollis, 420.
maculata, 418, 420, 573.
minutilla, 375, 420.
Pitangus sulphuratus bolivianus, 55.
s. derbianus, 123.
Pitylus fuliginosus, 57.
Planesticus migratorius, 440, 622.
m. migratorius, 239, 574.
Plath, Karl, abnormal plumage of the Scarlet Tanager, 127.
Platt, Charles, Chestnut-sided Warbler breeding in Montgomery County, Penna., 613.
Platypsaris aglaiae richmondi, 307.
Plectrophenax nivalis, 312, 275.
n. subnivalis, 312, 458.
n. insulae, 312.
Plover, Black-bellied, 421.
Golden, 132, 415, 416, 421, 436.
Killdeer, 277, 596.
Piping, 261, 421.
Semipalmated, 113, 241, 421, 593, 596.
Upland, 60, 376, 421, 442.
Wilson's, 644.
Pluvialis d. dominicus, 132, 415, 421, 436.

Podilymbus podiceps, 235, 367.
Poicephalus fuscicapillus, 150.
f. tanganyikae, 150.
Polihierax semitorquatus, 459.
Polioptila bilineata bilineata, 33.
b. albiventris, 33.
b. albiloris, 33, 34.
b. bairdi, 35.
c. caerulea, 277, 371.
californica, 65.
nigriceps nigriceps, 36.
n. restricta, 36.
superciliaris magna, 33.
Pooecetes gramineus, 372, 610.
Poole, Earl L., breeding of the Blue-winged Teal in Pennsylvania, 110.
Poospiza melanoleuca melanoleuca, 57.
Portenko, L. A., notice of his review of Hypotriorchus subbuteo, 306.
Porto Rico, birds of, 305, 426.
Porzana carolina, 249, 374, 573.
flaviventer bangsi, 460.
Prairie Chicken, 296.
Presbychen abavus, 148.
Progne subis, 370.
s. subis, 238, 566.
Prosteganura, 316.
haagneri okadai, 316.
Protonotaria citrea, 376, 434, 565, 612.
Psaltriparus minimus californicus, 431.
Pseudocalyptomena, 631.
Pseudochloris aureiventris, 57.
Psophia crepitans, 159.
Pternistes leucoscepus tokora, 314.
Ptiloprora plumbea granti, 313.
Puffin, 591.
Puffinus griseus, 105, 644.
inceptor, 148.
auduboni, 202.
floridanus, 202.
lherminieri, 106, 198, 644.
obscurus, 202.
Quail, 573.
Quebec, birds of, 169, 207, 511, 547, 605.
Querquedula cyanoptera, 109.
discors, 110, 373, 572, 615.
Quiscalus quiscula aeneus, 61, 238, 372.
q. quiscula, 252, 566.

Rail, King, 113, 130, 249, 367.
Sora, 245, 374, 573.
Virginia, 113, 375, 573.
Yellow, 617.
Rallus elegans, 130, 249, 367.
limicola, 573.
obsoletus rhizophorae, 308, 460.
virginianus, 375.
Ramphocoelus brazilius, 128.
passerinii, 488.
Randia, 468.
pseudozosterops, 468.
Rapp, F. W., notice of his 'Bird List of Vicksburg, Michigan,' 461.
'Raven, The,' reviewed, 311.
Raven, Southeastern, 616.
Recurvirostra americana, 280.
Redhead, 373, 572.
Redington, Paul G., the bird work of the Biological Survey, 229–234.
Red-wing, see Blackbird, Red-winged.
Rio Grande, 65.
Sonara, 61.
Thick-billed, 61.
Redpoll, 132.
Regulus calendula calendula, 239.
satrapa satrapa, 239, 283.
Reviere, B. B., review of his 'Birds of Norfolk,' 143; England, birds of, 144.
'Revista Italiana di Ornitologia' reviewed, 643.
Rhode Island, 511.
Rhyticeros, 601.
Richmondena cardinalis, 127.
c. canicauda, 63.

Richmondena cardinalis cardinalis, 372, 574.
c. superba, 63.
Riley, J. H., notice of his 'Three New Birds from Siam,' 307; notice of his papers on birds of Borneo and Mongolia, 148; see also Friedmann, Herbert.
Riparia riparia, 369.
Risser, Alden, 417, a note on nesting Killdeers, 417; Hermit Warbler in Minnesota, 435.
Roadrunner, 150.
Roads, Myra Katie, Doves using an old Robin's nest, 265; combined protection of young birds, 440; birds using old nests or nesting sites, 622.
Roberts, Thomas S., obituaries of Frank W. Commons, 474 and Edward A. Everett, 475.
Robin, 239, 370, 574, 622.
Robinson, H. C., and Kloss, C. B., notes of their 'Second Collection from Pulo Condore,' 307.
Robinson, H. W., notice of his 'Dates of Arrival of the Chiffchaff,' 644.
Rothrock, Boyd P., Blue Goose (Chen caerulescens) in Pennsylvania, 415.
Rothschild, Lord, notice of his 'On a Collection of Birds made by Mr. F. Shaw Mayer in the Weyland Mountains, New Guinea,' 461; and his 'Preliminary Review of the Mooruk Group of Cassowaries,' 461.
Russian Academy of Sciences, review of the Annals of the Zoölogical Museum of the, 297.

St. Croix, birds of, 147.
St. Louis Bird Club, notice of, 649.
Sanderling, 421.
Sandpiper, Baird's, 260, 442.
Sandpiper, Least, 113, 241, 375, 421, 596.
Pectoral, 113, 418, 420, 573, 596.
Red-backed, 113, 417, 593.
Semipalmated, 113, 421, 596.
Solitary, 113, 374.
Spotted, 113, 368, 421.
Stilt, 282, 417, 420, 596.
Western, 421.
White-rumped, 420.
Sapsucker, Yellow-bellied, 237, 426.
Saskatchewan, birds of, 511, 574.
Sawyer, E. J., notice of his 'Bird Houses, How to Make them, etc,' 461.
Saxicola torquata stonei, 304.
Say, Thomas, biography of, 299.
Sayornis phoebe, 237, 369, 574.
sayus sayus, 60.
Scaup, American, 572.
Lesser, 236, 367.
Schiöler, E. Lehn, review of his 'Birds of Denmark,' 457.
Schorger, A. W., notes from Wisconsin, 282; Arkansas, Kingbird at Roxbury, Wisc., 603; Prairie Marsh Wren wintering near Madison, Wisconsin, 614; review of his 'The Birds of Dane County, Wisconsin,' 627.
Sclater, W. L., personal mention, 331.
Scoter, American, 258, 282.
Seed-eater, Pygmy, 57.
Seiple, Stanley J., White Herons near Hartstown, Crawford Co., Pa., 113.
Seiurus aurocapillus, 215, 574.
noveboracensis noveboracensis, 129, 371.
Semple, J. B., personal mention, 480.
Senex, 306.
Senkenberg Museum, 379.
Sericornis magnirostris stresemanni, 157.

Sericornis magnirostris cantans, 157.
Setophaga ruticilla, 376.
Shadle, Albert R., a Crow impaled in flight, 270; a Grand Island (New York) heronry, 567–569.
Shea, Daniel W., obituary of, 648.
Shearwater, Audubon's, 105, 198, 644.
Sooty, 105, 644.
Shelley, Lewis O., the Golden Eagle in Cheshire County, New Hampshire, 118; some unusual bird notes from Cheshire County, N. H., 615; defensive cries of two species of birds, 622.
Sheppardia cyornithopsis bangsi, 150.
Sherman, Althea R., migrating Blue Jays, 272.
Shore-birds, flocking of, 181.
Shoveller, 110, 280, 572.
Shrike, Loggerhead, 574.
Migrant, 238, 371.
Northern, 132.
Sialia sialis sialis, 239, 370.
Siam, birds of, 307.
Sicalis flaveola holti, 57.
Silverbill, Andean, 55.
Siskin, Pine, 61.
Sitta carolinensis carolinensis, 239, 370.
castaneoventris almorae, 313.
pusilla, 254.
p. insularis, 644.
Skinner, M. P., Belted Kingfisher wintering in Yellowstone Park, 601.
Skovgard, P., Notice of his 'Sobre las Emigraciones de las Aves,' 461.
Skutch, Alexander F., the life history of Rieffer's Hummingbird (Amazilia tzacatl tzacatl) in Panama and Honduras, 481–500.
Slevin, Joseph R., notice of his 'Log of the Schooner "Academy",' 625.
Slocum, H. S., Little Blue Heron at Radford, Va., 112.
Smaragdolanius, 305.
Snethlage, Emilie, obituary, 161.
Snipe, Wilson's, 113, 236, 241, 374, 565–573.
Snyder, L. L., paired ovaries in hawks, 117.
Snyder, L. L. and Logier, E. B. S. notice of their 'Faunal Investigation of King Township, York Co., Ontario,' 146.
Somateria mollissima dresseri, 591, 615.
Sonora, birds of, 307, 308, 454, 460.
Sora, 249, 279.
'South Australian Ornithologist, The,' reviewed, 156, 468, 637.
South Carolina, birds of, 109, 201, 258, 260, 261, 266, 275, 279, 415, 417, 511, 597, 628.
South Dakota, birds of, 511.
Southampton Island, birds of, 335, 461.
Southard, Robert Hamilton, obituary of, 325.
Spain, birds of, 644.
Sparrow, Acadian Sharp-tailed, 242.
Brewer's, 62.
Cassin's, 62.
Chipping, 373.
Clay-colored, 126.
English, 574.
European House, 372.
Field, 137, 238, 253, 375, 574.
Fox, 137, 238, 241, 574.
Gambel's, 132, 282, 617.
Grasshopper, 252, 279, 610.
Harris's, 617.
Henslow's, 62, 279, 610, 618.
Ipswich, 615.
Lark, 62, 617.
Lincoln's, 62, 242.
Savannah, 61, 110, 238, 242, 376.
Scott's Seaside, 252.

Sparrow, Sharp-tailed, 126, 610.
Slate-colored Fox, 63.
Song, 238, 242, 373, 385.
Swamp, 238, 242.
Tree, 243, 574.
Vesper, 372, 610.
Western Chipping, 62.
Western Grasshopper, 62.
Western Henslow's, 238.
Western Lark, 62.
White-throated, 133, 238, 252, 243, 274.
Spatula clypeata, 110, 270, 572.
Spaulding, Nina G., the Yellow-bellied Sapsucker in Porto Rico, 426.
Speotyto cunicularia floridana, 644.
Sphyrapicus varius varius, 237, 426, 574.
Spiker, Charles J., review of his 'Biological Reconnaisance of the Peterboro Swamp and the Labrador Pond Areas,' 453.
Spinetail, Spix's, 54.
Spinus atratus fasciatus, 149.
pinus pinus, 61.
Spiza americana, 127, 372, 606.
Spizella breweri, 62.
monticola monticola, 574.
pallida, 126.
passerina, 373.
p. arizonae, 62.
pusilla pusilla, 238, 253, 375, 574.
Spoonbill, Roseate, 115, 259, 332, 423.
Sporophila caerulescens, 57.
luctuosa albilateralis, 149.
minuta minuta, 57.
Spreo superbus, 149.
Sprunt, Alexander, Jr., In memorium: Arthur T. Wayne, 1–16; early occurrence of the Gannet on the South Carolina coast, 109; certain land birds observed at sea, 133; the American Scoter again in winter on the South Carolina coast, 258; a specimen of Baird's Sandpiper from South Carolina, 260; the Pigeon Hawk in winter on the South Carolina coast, 266; total albinism in the Mallard, 414; the Golden Plover on the coast of South Carolina, 415; the Stilt Sandpiper near Charleston, S. C., 417; on the color of the iris of the Boat-tailed Grackle, 431; additional notes on winter shore-birds on the South Carolina coast, 261; abnormal sets of Heron eggs in coastal Carolina, 594; Wilson's Phalarope in South Carolina, 597; unusual nesting concentration in a single tree, 621.
Sprunt, Alexander, Jr., and Chamberlain, E. B., review of their 'Second Supplement to Wayne's Birds of South Carolina,' 628.
Squatarola squatarola, 421.
Stanford, J. S., Junco annectens in Utah, 611; notes on Hawks and Owls in Sevier Co., Utah, 618.
Starling, 314, 376, 605.
Marsh, 58.
Rosy, 315.
Steatornis caripensis, 186.
Steganopus tricolor, 417, 420, 593, 597.
Steganura aucupum kadugliensis, 459.
Stelgidopteryx serripennis, 376.
Stephens, T. C., notice of his 'Bird Records in the Upper Mississippi Valley,' 644.
Sterna albifrons guineae, 466.
dougalli, 248, 592.
forsteri, 248.
hirundo, 17–21, 248, 368, 591.
paradisea, 592.
Stevenson, J., an old record for the

Western Meadowlark from Ohio, 431.
Stewart, Paul A., a Red-headed Woodpecker destroys its own eggs, 122; bird injured by high tension wire, 440.
Stoddard, H. L., obituary of J. F. L'Hommedieu, 164; review of his 'The Bobwhite Quail,' 444.
Stone, Witmer, Dovekies on the coast of New Jersey and Virginia, 105; note on Townsend's Oregon Tubinares, 108; Rare Geese on the North Carolina coast, 111; obituary of Joseph Parker Norris, 329; the Prothonotary Warbler in southern New Jersey, 434; obituary of Spencer Trotter, 471; the new A. O. U. Check-List, 523–531; notice of his 'Three New Birds from Honduras,' 307.
Stoner, Emerson A., feeding of Horned Owl on Jerusalem crickets, 425; Jay and Bush-tit nesting in close proximity, 430; Marsh Hawk vs Coyotes, 599.
Storer, Tracy I., notice of his 'Results of Bird and Animal Introduction,' 644; notice of his 'Partial Bibliography of the Natural History of California,' 644.
Stressemann, Erwin, notice of his paper on hybrid Paradise Birds, 307.
Strix leptogrammica ticehursti, 317.
l. orientalis, 317.
varia varia, 237.
Strong, R. M., notice of his proposed bibliography of ornithology, 319.
Struthers, Parke H., personal mention, 331.
Sturnella magna, 238, 371, 574.
m. lilianae, 295.
neglecta, 431, 606.
Sturnus vulgaris, 376, 605.
Sula bassana, 109, 256.
Suthard, James G., Double-crested Cormorant at Chicago, 593.
Sutton, George M., the Blue Goose and Lesser Snow Goose on Southampton Island, Hudson Bay, 335-364; notice of his 'A Year at Southampton Island,' 461; personal mention, 480.
Svihla, Arthur, the fishing plunge of the Brown Pelican, 413.
Swales, Bradshaw H., see Wetmore, Alexander.
Swallow, Bank, 369.
Barn, 64, 121, 245, 370.
Cliff, 63, 245, 279, 370.
Rough-winged, 279, 460.
Tree, 245, 269, 279.
Swarth, Harry S., review of his 'The Avifauna of the Galapagos Islands,' 624; personal mention, 333.
Swenk, M. H., notice of his 'Food Habits of the Ring-necked Pheasant,' 151; notice of his 'Food of the Ring-necked Pheasant in central Nebraska,' 307.
Swift, Chinmey, 119, 237, 251, 368 427.
Switzerland, birds of, 145.
Sycobrotus stictofrons, 158.
Sylvia philadelphia, 107.
macgillivrayi, 107.
Synallaxis cherriei, 149
c. napoensis, 149.
rufogularis, 149.
rutilans, 149.
spixi, 54.

Taenioptera iruquero, 55.
Tanager, Archbishop, 56.
Blue, 56.
Brazilian Scarlet, 56.
Passerini's, 488.
Saira Red, 56.
Scarlet, 127, 616.

Tanager, South American Scarlet, 128.
Summer, 120.
Western, 130.
Tangavius aeneus, 65.
Taraba major kriegi, 54, 138.
Tavener, P. A., an albino Empidonax, 603.
Teal, Blue-winged, 110, 113, 373, 572, 615.
Cinnamon, 109, 414.
Green-winged, 572.
Telmatodytes palustris, 370, 566.
p. iliacus, 614.
Tennessee, birds of, 117, 267, 511, 598.
Teratornis merriami, 462.
Tern, Arctic, 592.
Black, 368, 572.
Caspian, 248.
Common, 17–21, 238, 244, 368, 591.
Forster's, 248.
Roseate, 248, 592.
Terrill, L. McI., nesting of the Saw-Whet Owl in the Montreal District, 169–174.
Tetrao albus, 617.
Texas, birds of, 274.
Thamnophilus palliatus puncticeps, 149.
Thlypopsis, 294.
Thrasher, Brown, 239, 370, 622.
Sage, 283.
Thraupis ornata, 56.
sayaca sayaca, 56.
Thrush, Gray-cheeked, 121.
Hermit, 239, 277.
Olive-backed, 121.
Russet-backed, 435.
Wood, 574.
Thrushes, song of, 137.
Thryomanes bewicki bewicki, 239, 622.
Thryothorus l. ludovicianus, 132, 239, 276.
Thryothorus rutilus rutilus, 56.
Ticehurst, C. B., personal mention, 331.
Titmouse, Tufted, 239, 278.
Todd, W. E. Clyde, on Vireo chivi and its allies, 407–412; the races of Hylophylax naevioides, 428; eastern records for the Russet-backed Thrush, 435.
Todirostrum, 294.
cinereum finitimum, 497.
Tompkins, Ivan R., further notes from the Savanna River entrance, 279; additional species for the Georgia list, 435.
'Tori,' reviewed, 316, 642.
Totanus melanoleucus, 261, 374, 421.
flavipes, 263, 374, 421, 566, 573.
Towhee, 238, 253, 375.
Abert's, 274.
Arctic, 63.
San Diego, 63.
Sclater's, 65.
Townsend, Charles W., a Shufeldt's Junco in Ipswich, Mass., 274; tragedies among Yellow-billed Cuckoos, 602; nesting of Red-winged Black-birds on a hill top, 607; on the color of the iris in the Boat-tailed Grackle, 609.
Toxostoma curvirostre insularum, 307.
rufum, 239, 370, 622.
Trachyphonus margaritatus kingi, 459.
Trans-baikalia, birds of, 297.
Trautman, Milton B., Snowy Egret at Buckeye Lake, Ohio, 112; status of the American and Lesser Scaup Ducks in Ohio, 257.
Tringa canutus, 131.
solitaria, 374.
Trinidad, birds of, 186, 427, 449.
Troglodytes aedon, 375.
a. aedon, 133.

Troglodytes musculus bonariae, 56.
m. clarus, 56.
troglodytes suprapallidus, 157.
Trotter, Spencer, obituary of, 471.
Trugon terrestris mayri, 466.
Trupialis militaris militaris, 58.
Turdus javanicus biesenbachi, 157.
migratorius, 370.
Turkey, Wild, 374.
Turnstone, 421.
Ruddy, 113.
Tuttle, H. E., Mockingbird nesting on Nantucket, Mass., 130.
Tyrannus dominicensis dominicensis, 251.
melancholicus melancholicus, 55.
tyrannus, 369.
verticalis, 123, 270, 603.
Tyrant, Bellicose, 55.
Blue-billed Black, 55.
Short-winged, 55.
White-headed Marsh, 55.
Tyrrell, W. Bryant, Cinnamon Teal in Michigan, 109; 414; Little Blue Heron and Egret in Michigan, 114; late Pine Grosbeaks, 126; notes from Whitefish Point, Mich., 131.
Tyto pratincola, 237, 438, 573, 599.

Uchida, Seinosuke, review of his 'Photographs of Bird Life in Japan, II. Birds of Mt. Fuji,' 626.
Underdown, C. Eliot, original publication of Chionophilos alpestris insularis, 441; Prothonotary Warbler in west-central Michigan, 612; on the status of Chlorospingus olivaceus, 612.
Urner, Charles A., Black Vulture in New Jersey, 116; Solitary Vireo nest building in New Jersey, 128; the shorebird flight of 1930 on the New Jersey coast, 418.

Utah, birds of, 611, 618.

Van Gorder, William, notes on weights of birds, 572–574.
Van Oort, E. D., notice of his 'Results of Bird Banding at the Natural History Museum at Leiden,' 462.
van Rossem, A. J., concerning some Polioptilae of the west coast of Middle America, 33–39; notice of his 'Sonoran Races of Camptostoma and Platypsaris,' 307; notice of his descriptions of new birds from Sonora and northwestern Mexico, 307; notice of his 'Report on a Collection of Land Birds from Sonora,' 454.
Van Schaick, John, notice of his 'The Little Hill Farm,' 302.
Van Tyne, Josselyn, personal mention, 331; see also Bangs, Outram.
Veery, 616.
Vermivora celata celata, 253.
chrysoptera, 565.
leucobronchialis, 434, 613.
pinus, 130.
ruficapilla ruficapilla, 276, 647.
Vireo, Blue-headed, 253.
Hutton's, 64.
Mountain Solitary, 616.
Philadelphia, 121.
Plumbeous, 614.
Red-eyed, 121, 371.
Solitary, 128.
Warbling, 253, 371.
Western Warbling, 64.
White-eyed, 253.
Yellow-green, 575–587.
Yellow-throated, 253.
Vireo agilis, 407.
calidris, 407.
caucae, 411.
caucae **solimoensis**, 412.
chivi, 407.
flavoviridis, 407, 575–587.

Vireolanius pulchellus, 305.
Vireosylva gilva gilva, 253, 371.
g. swainsoni, 64.
griseobarbatus, 407.
griseus griseus, 253.
huttoni huttoni, 64.
olivacea, 371, 407.
vividior, 407.
Virgin Islands, birds of, 147.
Virginia, birds of, 110, 112, 127, 201, 276, 418, 425.
Virginia Ornithological Society, 333.
Viridibucco coryphaea jacksoni, 312.
Viudita, 55.
'Vogelzug, Der,' reviewed, 158, 315; 469, 640.
Vogt, William, American Egret in Connecticut, 593; Orchard Oriole in the Adirondacks, 606; personal mention, 480, 651.
von Burg, G. and Knopfli, W., notice of their continuation of 'Les Oiseaux de la Suisse,' 145.
Vulture, Black, 116, 117, 236, 598.
Turkey, 236, 279, 374.

Wait, W. E., see Henry's Birds of Ceylon, 146.
Walkinshaw, Lawrence H., Lesser Snow Geese in Barry County, Michigan, 258; Wilson's Phalarope and Red-backed Sandpiper at Battle Creek, Mich., 417; Western Meadowlark at Battle Creek, Mich., 606; Brewster's Warbler in Calhoun Co., Mich., 613; nesting of the Sandhill Crane in Calhoun Co., Mich., 594; see also Olsen, Richard E.
Warbler, Audubon's, 435.
Barbados Yellow, 58.
Bay-breasted, 121.
Black and White, 129.
Blackburnian, 121, 278.
Blackpoll, 129, 243.
Warbler, Black-throated Blue, 278, 512–522.
Black-throated Green, 574, 616.
Blue-winged, 130.
Brewster's, 434, 613.
Cairn's, 616.
Canadian, 616.
Cape-May, 129.
Cerulean, 64.
Chestnut-sided, 121, 613, 616.
Golden-winged, 121, 243, 565.
Grace's, 64.
Hermit, 435.
Hooded, 128.
Kirtland's, 276.
Magnolia, 121, 129, 243, 245, 278.
Mourning, 64, 121.
Myrtle, 121, 133, 134, 238, 243, 245, 574.
Nashville, 64, 245, 276.
Northern Parula, 279.
Orange-crowned, 253.
Palm, 133, 134, 614, 615.
Parula, 64.
Pine, 134, 239.
Prairie, 437.
Prothonotary, 121, 376, 434, 565, 612.
Tennessee, 121.
Western Yellow, 64.
Wilson's, 129.
Yellow, 121, 243.
Yellow-Palm, 254.
Waterfowl, 139.
Waterson, William H., Audubon's Warbler in northern Ohio, 435.
Water-Thrush, 121.
Northern, 129, 371.
Water-Turkey, 235, 592.
Waxwing, Bohemian, 432.
Cedar, 238, 253, 375.
Wayne, Arthur T., in memorium, 1–16, 628.
Weights of birds, 572.
Weiss, Harry B., and Ziegler, Grace

M., review of their 'Thomas Say, Early American Naturalist,' 299.
West Indies, birds of, 147, 644.
West Virginia, birds of, 294, 598.
Weston, Francis M., notes from Escambia County, Florida, 442.
Wetmore, Alexander, a seventeenth century representation of the Cardinal, 127; recent papers by, 148; the Hudsonian Godwit in the Dominican Republic, 596; notice of his 'The Bullfinch of Ile a Vache, Haiti,' 308; notice of his 'Avifauna of the Pleistocene in Florida,' 462; notice of his 'Afield with the Birds of Northern Spain,' 644; personal mention, 334, 480.
Wetmore, A., and Lincoln, F. C., the Chuck-wills-widow in Maryland, 121; the Sharp-tailed Sparrow at Chesapeake Beach, Md., 126.
Wetmore, Alexander and Perrygo, W. M., notice of their 'Cruise of the Esperanza to Haiti,' 644.
Wetmore, Alexander, and Swales, B. H., review of their 'Birds of Haiti and the Dominican Republic,' 451.
Weygandt, Cornelius, review of his 'The Wissahickon Hills,' 136.
White, F. B., manners of Holboell's Grebe in captivity, 559–563.
Widgeon, European, 256.
Widmann, Otto, personal mention, 649.
Wight, H. M., quantative methods in upland game bird investigation, 553–558.
Willet, 421.
Willett, George, notice of his 'Ten Year Index to the Condor,' 455.
Williams, C. B., review of his 'The Migration of Butterflies,' 298; review of his 'Trinidad Birds,' 449.
Williams, Laidlaw, see Fry, Gladys Gordon.
'Wilson Bulletin, The,' reviewed, 154, 309, 463, 633.
Wilson, Alexander, 305; correspondence with Jefferson, 175; notice of Gordon Wilson's sketch of, 462.
Wilson, Etta S., tameness of the Saw-whet Owl, 266.
Wilson, Gordon, notice of his 'Alexander Wilson, Poet, Essayist, Ornithologist,' 462.
Wilsonia canadensis, 616.
  mitrata, 128.
  pusilla, 129.
Wing, Leonard W., notes from Jackson County, Mich., 131; some additional notes from Michigan, 618.
Wisconsin, birds of, 282, 296, 416, 511, 603, 614, 627.
Witherby, H. F., simultaneous loss of primaries in prenuptial moult of Loon, 105.
Wolstenholme, Harry, obituary of, 326.
Wood, Merrill, intestinal parasites in Sharp-shinned Hawks, 265.
Wood, Norman A., rare birds from Keweenaw County, Mich., 616.
Woodcock, 368.
  shooting season for, 334.
Woodpecker, Downy, 237, 369.
  Hairy, 237, 565.
  Ivory-billed, 438.
  Northern Pileated, 279.
  Pileated, 237.
  Red-bellied, 237.
  Red-headed, 122, 237, 250, 279.
Woodpeckers, 147.
Woronesh, birds of, 298.
Worthington, W. W., personal mention, 333.
Wren, Bar-throated, 56.

Wren, Bewick's, 239, 622.
Carolina, 132, 239, 276.
Durango, 65.
House, 133, 375.
Long-billed Marsh, 370, 565.
Prairie Marsh, 614.
Short-billed Marsh, 278.
Trinidad, 56.
White-faced Marsh, 55.
Winter, 284.
'Wren-Tit, The,' reviewed, 154, 311.
Wren-Tit, Pallid, 65.
Wright, Earl G., and Bailey, A. M., two species of birds new to Louisiana, 123.
Wyoming, 601.

XANTHOCEPHALUS xanthocephalus, 437.
Xenoctistes subalaris ruficrissa, 149.
Xiphirhynchus superciliaris rothschildi, 156.

YELLOW-LEGS, Greater, 113, 374, 421.
Lesser, 245, 261, 263, 374, 421, 566, 573, 596.
Yellow-throat, Brazilian, 56.
Maryland, 371.
Salt Marsh, 65.
Young, C. J., further notes on the birds of the Magdalene Islands, 240–245.

ZAMELODIA ludoviciana, 616.
Zenaidura macroura carolinensis, 133, 236, 265, 378, 622.
m. marginella, 265.
Ziegler, Grace M., see Weiss, Harry Harry B.
Zimmer, John T., notice of his 'Birds of the Marshall Field Peruvian Expedition,' 294.
Zonotrichia albicollis, 133, 238.
leucophrys gambeli, 132, 274, 252.

DATES OF ISSUE.

Vol. XLVII, No. 4—October 13, 1930.
Vol. XLVIII, No. 1—January 4, 1931.
Vol. XLVIII, No. 2—April 10, 1931.
Vol. XLVIII, No. 3—July 9, 1931.

THE AUK

A Quarterly Journal of Ornithology

ORGAN OF THE AMERICAN ORNITHOLOGISTS' UNION

Edited by Dr. Witmer Stone

ACADEMY OF NATURAL SCIENCES, LOGAN SQUARE

PHILADELPHIA, PA.

To whom all articles and communications intended for publication and all books and publications for review should be sent.

Manuscripts for leading articles must await their turn for publication if others are already on file, but they must be in the editor's hands at least six weeks before the date of issue of the number for which they are intended, and manuscripts for 'General Notes,' 'Recent Literature,' etc., not later than the first of the month preceding the date of issue of the number in which it is desired they shall appear.

Twenty-five copies of leading articles are furnished to authors free of charge. Additional copies or reprints from 'General Notes,' 'Correspondence,' etc., must be ordered from the editor.

THE OFFICE OF PUBLICATION

8 WEST KING STREET, LANCASTER, PA.

Subscriptions may also be sent to W. L. McAtee, Business Manager, 200 Cedar St., Cherrydale, Va. Foreign Subscribers may secure 'The Auk' through H. F. and G. Witherby, 326 High Holborn, London, W. C.

Subscription, $4.00 a year. Single numbers, one dollar.

Free to Honorary Fellows, and to Fellows, Members, and Associates of the A. O. U., not in arrears for dues.

MEETINGS OF THE A. O. U.

Meeting	Date	Place	Fellows Present	Total Membership
1	1883, Sept. 26–28	1st New York	21	23
5	1887, Oct. 11–13	1st Boston	17	284
10	1892, Nov. 15–17	4th Washington	20	557
11	1893, Nov. 20–23	2d Cambridge	17	582
12	1894, Nov. 12–15	6th New York	15	616
13	1895, Nov. 11–14	5th Washington	19	667
14	1896, Nov. 9–12	3d Cambridge	14	673
15	1897, Nov. 8–11	7th New York	18	679
16	1898, Nov. 14–17	6th Washington	21	695
17	1899, Nov. 13–16	1st Philadelphia	16	744
18	1900, Nov. 12–15	4th Cambridge	19	748
19	1901, Nov. 11–14	8th New York	18	738
20	1902, Nov. 17–20	7th Washington	25	753
20a	1903, May 15–16	1st San Francisco	7	—
21	1903, Nov. 16–19	2d Philadelphia	19	775
22	1904, Nov. 28–Dec. 1	5th Cambridge	17	808
23	1905, Nov. 13–16	9th New York	17	860
24	1906, Nov. 12–15	8th Washington	24	750
25	1907, Dec. 9–12	3d Philadelphia	20	850
26	1908, Nov. 16–19	6th Cambridge	17	888
27	1909, Dec. 6–9	10th New York	19	866
28	1910, Nov. 14–17	9th Washington	23	897
29	1911, Nov. 13–16	4th Philadelphia	18	887
30	1912, Nov. 11–14	7th Cambridge	18	929
31	1913, Nov. 10–13	11th New York	28	992
32	1914, Apr. 6–9	10th Washington	27	1101
33	1915, May 17–20	2d San Francisco	11	1156
34	1916, Nov. 13–16	5th Philadelphia	26	830
35	1917, Nov. 12–15	8th Cambridge	21	891
36	1918, Nov. 11	12th New York	14	953
37	1919, Nov. 10–13	13th New York	28	1024
38	1920, Nov. 8–11	11th Washington	25	1142
39	1921, Nov. 7–10	6th Philadelphia	25	1351
40	1922, Oct. 23–26	1st Chicago	24	1457
41	1923, Oct. 8–11	9th Cambridge	25	1652
42	1924, Nov. 10–13	1st Pittsburgh	26	1637
43	1925, Nov. 9–12	14th New York	30	1705
44	1926, Oct. 11–14	1st Ottawa	22	1815
45	1927, Nov. 14–17	12th Washington	30	1772
46	1928, Nov. 19–22	1st Charleston	27	1741
47	1929, Oct. 21–24	7th Philadelphia	25	1858
48	1930, Oct. 20–23	1st Salem	31	1960

The next Stated Meeting will be held at Detroit, Mich., October 19–22, 1931.